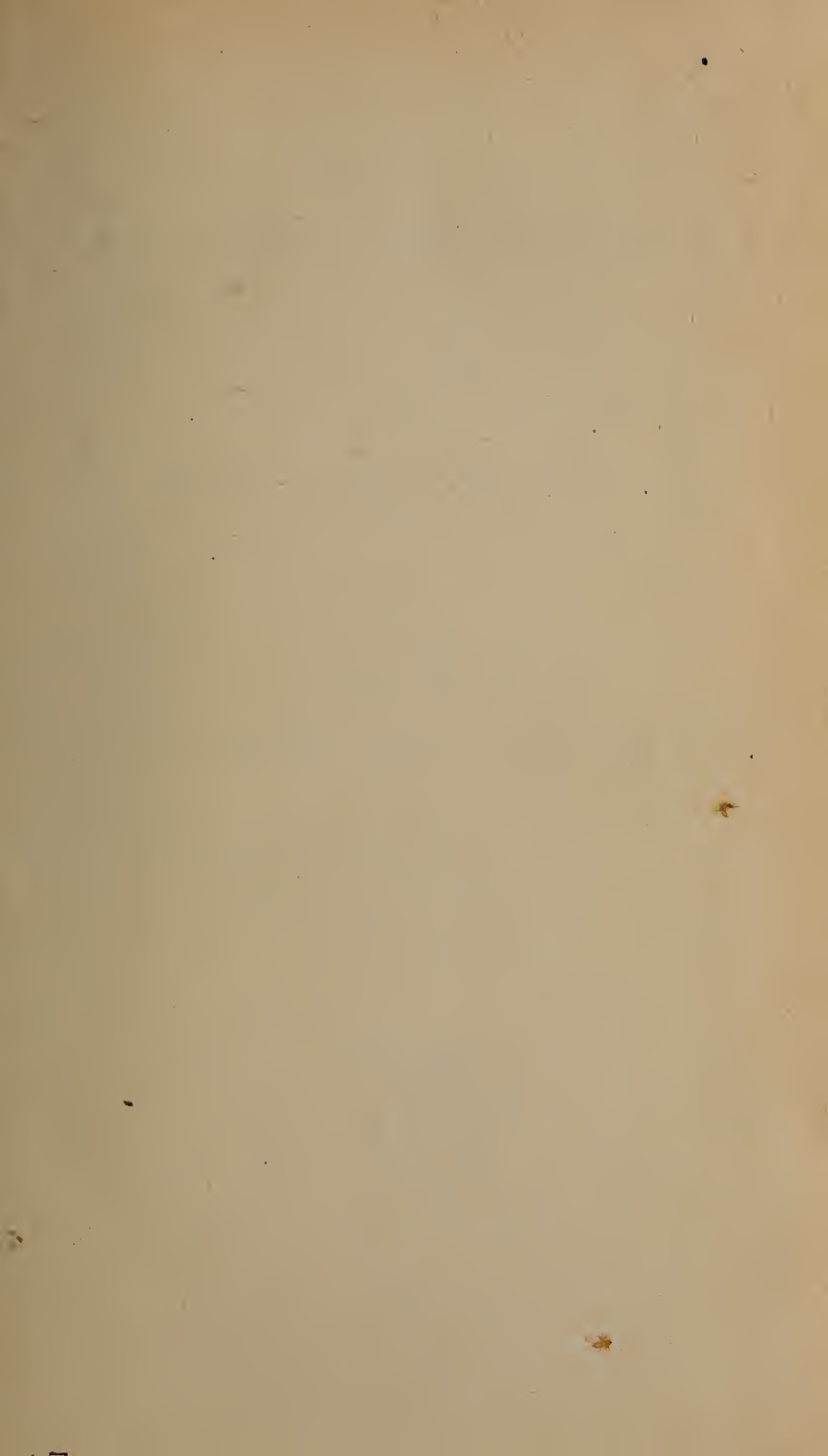
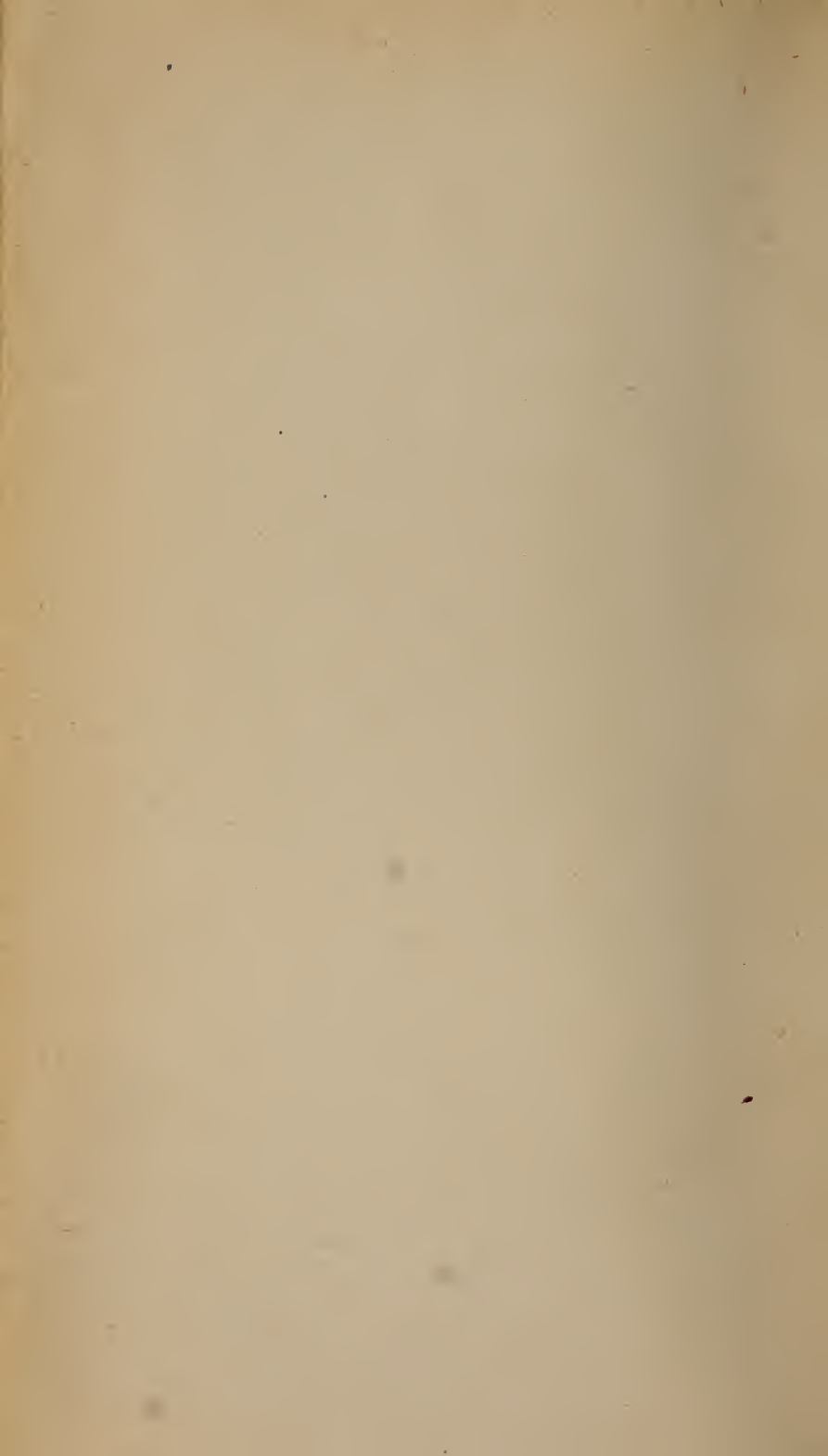




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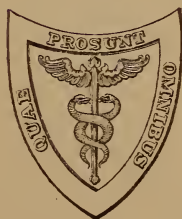


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Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of August.

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The following works have been received:—

Transactions of the Obstetrical Society of London for 1881. London: Longmans, Green & Co., 1882.

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Myxœdema. By A. CLIFFORD MERCER, M.D., F.R.M.S. New York, 1881.

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Treatment of Irreducible Epiplocele. By L. McLANE TIFFANY, M.D. Baltimore.

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The Study of Hygiene in Public Schools. By STANFORD E. CHAILLÉ, M.D.

Dentists as Specialists. By G. L. PARMELEE, M.D. Springfield, 1882.

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Refraction of the Eye. By H. CULBERTSON, M.D.

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- Carotid Compression and Brain Rest. By J. L. CORNING, M.D. New York, 1882.
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 Addresses at the Inauguration of Wm. Pepper, M.D., as Provost of the University of Pennsylvania. Some Points in the Treatment of Typhoid Fever. Some of the Relations of Catarrhal Affections. By WM. PEPPER, M.D., LL.D.
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 Proceedings of Medical Society of the County of Kings. April, May, June, 1882.
 Transactions of the Rhode Island Medical Society. Vol. ii. Part v. 1881.
 Quarterly Transactions of the Lancaster Medical Society. Jan. and April, 1882.
 Report of Births, Marriages, and Deaths in Rhode Island. Providence, 1882.
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The following Journals have been received in exchange :—

- Alienist and Neurologist, Jan. to April, 1882.
 American Journal of Insanity, Jan. to April, 1882.
 American Journal of Neurology and Psychiatry, Feb., May, 1882.
 American Journal of Obstetrics, Jan. to April, 1882.
 American Journal of Otolaryngology, Jan. to April, 1882.
 American Journal of Pharmacy, Jan. to June, 1882.
 American Journal of Science, Jan. to June, 1882.
 American Journal of Dental Science, Dec. 1881, to May, 1882.
 American Medical Digest, Jan. to June, 1882.
 American Practitioner, Dec. 1881, to June, 1882.
 American Medical Weekly, April to June, 1882.
 Annals of Anatomy and Surgery, Jan. to May, 1882.
 Archives of Dermatology, Jan. 1882.
 Archives of Medicine, Feb. to June, 1882.
 Archives of Ophthalmology, Dec. 1881, to March, 1882.
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 Atlanta Medical and Surgical Journal, Feb. to June, 1882.
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 Chicago Medical Review, Dec. 1881, to June, 1882.
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 Dental Cosmos, Jan. to June, 1882.
 Fort Wayne Journal of the Medical Sciences, Jan. to April, 1882.
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 Ephemeris of Materia Medica, Pharmacy, and Therapeutics, Jan., March, May, 1882.
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 Half-Yearly Compendium of Med. Science, Jan. 1882.
 Journal of the Franklin Institute, Jan. to June, 1882.

Journal of Nervous and Mental Diseases, Jan. to April, 1882.
 Journal of Comparative Medicine and Surgery, Oct. 1881, to Jan. 1882.
 Independent Practitioner, Feb. to May, 1882.
 Illustrated Quarterly of Medicine and Surgery, Jan. to April, 1882.
 Kansas Medical Index, Dec. 1881, to May, 1882.
 Louisville Medical News, Jan. to June, 1882.
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 Medical Gazette, Jan. to June, 1882.
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 New Orleans Medical and Surgical Journal, Jan. to June, 1882.
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 North Carolina Medical Journal, Dec. 1881, to May, 1882.
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 Ohio Medical Journal, Jan. to June, 1882.
 Pacific Medical and Surgical Journal, Dec. 1881, to May, 1882.
 Pittsburg Medical Journal, Jan. to May, 1882.
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 Philadelphia Medical Times, Jan. to June, 1882.
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 Canada Medical Record, Dec. 1881, to May, 1882.
 Canada Medical and Surgical Journal, Dec. 1881, to April, 1882.
 L'Union Médicale du Canada, Jan. to May, 1882.

The usual foreign exchanges have been received; their separate acknowledgment is omitted for want of space.

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XXXII. A Text-book of Practical Medicine, with particular reference to Physiology and Pathological Anatomy. By Dr. Felix von Niemeyer, Professor of Pathology and Therapeutics, Director of the Medical Clinic of the University of Tübingen. Translated from the eighth German edition, by George H. Humphries, M.D., and Charles E. Hackley, M.D. In two volumes, pp. 767 and 861. Revised edition. New York: Appleton & Co., 1881	223
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- XXXV. Causes of Deafness among School Children, and its Influences on Education, with Remarks on the Instruction of Pupils with Impaired Hearing, and on Aural Hygiene in the Schools. By Samuel Sexton, M.D., Aural Surgeon to the New York Eye and Ear Infirmary, Member of the American Otological Society, etc.
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FOR JULY 1882.

ARTICLE I.

ON THE NATURE, MODE OF PROPAGATION, PATHOLOGY, AND TREATMENT OF SCARLATINA. By JOHN A. OCTERLONY, A.M., M.D., Professor of the Principles and Practice of Medicine, in the Kentucky School of Medicine, Louisville, Ky.

Opinionum commenta delet dies, nature judicia confirmat.—CICERO.

THE materials for this paper were furnished by fifty-eight cases of scarlatina observed and treated by the writer during a series of years, and of which records, more or less complete, were made at the time of observation. These records were kept without any other object than to preserve in available form an experience which otherwise would ere this have become a dim and imperfect recollection. The facts recorded were not seen through the medium of any theory, and I hope I have utilized my materials in the same impartial spirit in which they were gathered together.

The title was formulated by the Prize Essay Committee of the Kentucky State Medical Society, which also prescribed that the paper should embody original researches or clinical observations. This fact will explain the almost exclusively clinical method in which the subject is treated. Owing to the incessant demands of an active practice, and other professional duties, the paper was not completed within the time prescribed by the Committee. In the hope that it may contain something of value, the author now submits it to the profession in these pages.

The Nature of Scarlatina.—It seems that although one had never read anything relating to scarlatina, but had intelligently observed the disease for a few years, as it appears season after season in our cities, towns, and villages, and even in sparsely settled neighbourhoods in the country, he

would soon have convincing evidence that it spreads by personal communication from one to another. As observation continued and became more extended it would also appear that all persons are not equally susceptible to the morbid influence. A further examination could not fail to reveal that among those exempt from its inroad a large proportion had already had the disease, and that among those suffering from it only a very small number had ever had a prior attack.

These two peculiarities, namely, propagation from one person to another, and the almost perfect immunity conferred by a previous attack, would quickly lead the observer to class scarlatina with the group of infectious diseases to which it really belongs. Doubtless there may even now be some who deny the correctness of this view, but, even if recognized authorities were not unanimous on this point, the writer would still be compelled, on clinical grounds, to maintain that scarlatina is an acute infectious disease.

When large numbers of individuals, living under the most varied conditions, are attacked within a short time by the same disease, which often successively affects one member after another in the same family, we naturally look for a common cause. On analyzing my cases no reason can be found to ascribe the disease to either atmospheric or telluric conditions, for they occurred at all seasons and under the most different thermometric and barometric conditions.

In but few instances could the disease have been due to bad hygienic surroundings, for the majority of the cases occurred in families whose dwellings and mode of life were as nearly perfect as possible.

In only 21 out of 58 cases could the disease be traced to communication with scarlet fever patients, and only 24 cases occurred during the prevalence of scarlet fever epidemics. So that in 34 cases out of 58 which occurred when there was no wide-spread epidemic, the source of the disease could not be detected or was overlooked, or else the disease originated *de novo*, independent of infection from another person affected with it. The following case appears to belong to this doubtful class:—

CASE I.—W. G., æt. 5 years, was seized with vomiting, became drowsy and had fever. On the next day the characteristic rash appeared, and soon became general; there was moderate sore-throat, slight and transient albuminuria, but no casts. The rash had entirely disappeared by the end of the seventh day, and was followed by moderate desquamation, which was completed at the end of three weeks. This child had been confined to the premises of his parents for weeks prior to his illness. No case of scarlatina had occurred in the neighbourhood, and, so far as could be ascertained by careful inquiry, no one visiting the house had been near a scarlatinous patient for months. The disease was not prevailing to any marked extent in any part of the community at the time, and had not prevailed for a good while previously.

It is even more difficult to account for the sudden appearance of scarlatina in an isolated locality, where the disease has not been for a long time,

where no communication with an infected locality has taken place, and where no case of the disease has been known to exist for many miles around. There is of course a possibility that a light case, or cases, may have really occurred which were overlooked, and which served as a focus of infection. The plausibility of this supposition is shown by the following case:—

CASE II.—In the summer of 1876 I saw in consultation with a professional friend, a little boy about 6 years of age, who had general dropsy and uræmia. Careful inquiry elicited the fact that about three weeks before he had a slight scarlet rash, which did not remain long and did not make him sick at the time. Yet nephritis and uræmia ensued, and the little patient died in convulsions very shortly after I saw him. In this case the nature of the rash had been overlooked by the mother, who had no idea that her child had scarlatina, and only consulted a physician when the dropsy and great pallor, having reached a formidable degree, suggested to her mind that the child might be in a dangerous condition.

The question of a *de novo* origin of scarlatina has become considerably narrowed down since it became known that the disease occurs also in several species of domestic animals, namely, the cat, dog, horse, and hog. It can hardly be doubted that many cases which were supposed to have originated independent of infection may have been due to transmission of the disease from some of these lower animals.

The infectious nature of scarlatina was strongly indicated in a good many instances among my fifty-eight cases. In the family of Mr. A. were five children, whose ages ranged from 23 months to 10 years. The four younger ones successively sickened, but the oldest, a remarkably strong and healthy boy, who had passed through an attack of scarlatina four years before, escaped. In Mr. M.'s family were also five children, of these the three younger were successively taken sick, so as to make it very apparent that those later attacked had contracted the disease from the first. The two elder children had several years before had a severe attack of scarlet-fever, nevertheless one of them now had the disease again with nephritis and uræmic convulsions. Mr. B. had a family of six children; one of these developed scarlatina, and in the course of two weeks four of the children were taken down with it. The youngest, a suckling infant of six months, alone escaped. Many other similar cases have occurred in my experience, but I restrict myself to those which belong to the number included in the clinical material of this paper.

A study of larger numbers of cases would undoubtedly make the infectious nature of scarlatina appear more conspicuous, but even the cases recorded by me sufficed to impress it very emphatically on my own mind.

The lesson taught by clinical observation has been confirmed by experimental inoculation, and the results amount to absolute demonstration. Miquel, Stole, Rostan, and Williams relate cases in which healthy persons were artificially infected by inoculating them with blood, or epidemic

scales taken from scarlet fever patients. The contents of vesicles on the skin of patients with scarlatina have also been used for the same purpose. These inoculations appear not only to have been followed by the characteristic febrile exanthem, in some instances as violent as the disease naturally contracted, but they also conferred, at least, a certain degree of protection, for repeated inoculation failed to produce the rash and fever, which had followed the first.

Turning now from further consideration of the infectious nature of scarlatina, to inquire into the nature of the infecting agent, the writer finds himself face to face with a problem that has excited the curiosity of medical men for ages, and baffled their closest investigations.

While some have frankly confessed entire ignorance as to everything concerning the contagium of scarlatina, declaring that we know nothing about it save its effects, others have thought that the bacteria found in the blood of scarlatina patients constitute the infectious substance and the true and only cause of the disease. In some of the few autopsies made by the writer he found bacteria in great numbers both in the blood and serous effusions in the pleuræ, pericardium, and peritoneum. But as in these cases the examination was not made very soon after death, the presence of the bacteria was attributed to decomposition, and when found in the blood of one patient during life they were supposed to be the result rather than the cause of the disease. All this time it was believed that the scarlatinous poison existed in the blood, and it was known also that inoculations with blood from scarlet fever patients had infected healthy persons with the disease. Neither was it unknown to the writer that the injection of blood from scarlet fever patients in which bacteria were present, was followed by the appearance of innumerable bacteria in the blood of the animal receiving the injection, while at the same time grave constitutional disturbances manifested themselves, and the greater number of animals thus treated died—but not with the characteristic symptoms of scarlatina. Hence one could not regard the presence of bacteria in the blood of scarlatinous patients as having solved the question. What is the nature of the poison of scarlatina? Microscopical investigations extending over a series of years have led to the discovery of a minute organism which appears to be peculiar to scarlet fever. The discovery was made by the distinguished Dr. Eklund,¹ of Stockholm, but, so far as the writer has been able to ascertain, it has not, up to this time, been laid before the medical profession of the United States. Under these circumstances, and having repeated, and to some extent confirmed, the investigations of Dr. E., I feel at liberty to give the following *résumé* of the conclusions to which these investigations have led.

In the urine of scarlatinous patients there is constantly present a truly

¹ Contribution a la Geographie Medicale.

prodigious mass of peculiar cellular bodies, which have received the name of *plax scindens*. They consist of sporoidal cells, flat, oval, or rounded, and either colourless or yellowish-white; they have a distinct cell wall, and a nucleus of a clear brownish colour. Sometimes the nucleus contains a very minute nucleolus. As seen floating about in the fluid examined, they often exhibit rotatory or screwing or see-saw movements. The investigations of Dr. Eklund thus far I have repeatedly verified. He further observed that these little bodies multiply first by division of the nucleolus, then the nucleus divides, lastly the cell itself undergoes division. He has never been able with certainty to determine that mycelium filaments develop from these cells. As a rule they were found free, and only exceptionally were they accompanied with extremely minute mycelial filaments. The cells of *plax scindens* never arrange themselves in rows like strings of beads, as do ferments, nor do they cling together in groups, as do the *zooglœa* properly so called.

The cells of "*plax scindens*" are certainly not identical with the small corpuscles described by Schultze, and mentioned in the first volume of Stricker's "*Histology*," page 379. The latter were found in the blood of healthy persons; the former, so far as yet ascertained, only in persons with scarlatina. It also seems that they differ materially in character and conformation.

The hæmatoblasts of Hayem, mentioned in Satterthwaite's "*Histology*," page 47, also differ materially from the cells of *plax scindens*.

The hæmatoblasts are said to make their appearance in the blood during convalescence from acute fever, and after considerable losses of blood, while the cells of *plax* are found in greatest abundance during the height of scarlet fever, not only in the blood, but also in the urine, and then rapidly disappear.

Since my attention was called to this interesting discovery, I have often examined the urine of patients having scarlatina, and have always found the *plax scindens* in great numbers. Examinations of blood from scarlatinous patients also revealed the presence of the same cells. So far as my own limited observations go, the *plax scindens* is not found in the blood or urine in any other disease than scarlatina, and is said to be constantly present in these fluids in this disease. Hence it would appear as if the infectious agent in scarlatina has at last been found. All honour to our distinguished transatlantic investigator. The writer of this essay congratulates himself upon having had this opportunity of calling the attention of his professional brethren of the United States to this interesting and important research of Dr. Eklund.

Mode of Propagation.—The mode of propagation of a disease depends upon its nature, the latter in its turn is determined by the nature of the cause to which it is due. The circumstances or conditions favourable to the active operation of the cause must also be taken into account in order

to understand the mode of propagation. Hence a study of the susceptibility to scarlatina, and the nature and origin of the *plax scindens* (believed to be its only cause), are both essential to the investigation of its mode of spreading.

Differences in the degree of susceptibility to this as well as to other infectious diseases are of daily observation. Age appears to be a powerful element in creating a predisposition to scarlatina, as will be seen by the following table giving the age of my cases:—

							Males.	Females.	Total.
Under 1 year							1	1	2
Between 1 and 2 years							1	2	3
“ 2 “ 3 “							2	0	2
“ 3 “ 4 “							3	2	5
“ 4 “ 5 “							4	5	9
“ 5 “ 6 “							3	2	5
“ 6 “ 7 “							7	2	9
“ 7 “ 8 “							1	3	4
“ 8 “ 9 “							3	0	3
“ 9 “ 10 “							0	2	2
“ 10 “ 11 “							1	2	3
“ 11 “ 12 “							0	2	2
“ 12 “ 13 “							1	2	3
“ 13 “ 14 “							0	0	0
“ 14 “ 15 “							1	0	1
“ 15 “ 16 “							0	2	2
“ 22 “ 23 “							0	1	1
“ 26 “ 27 “							0	1	1
“ 32 “ 33 “							0	1	1
							28	30	58

From this table it would appear that young infants are not very susceptible to the disease. Only two cases out of fifty-eight were under one year. The first was a girl of three weeks; the rash was well marked and typical; the throat but slightly affected; the urine could not conveniently be examined; there was decided desquamation, but the scales were rather branny than flaky, and not excessive in quantity. Convalescence was established within a week.

The second was a boy, almost a year old, large and fat. The rash was characteristic, but moderate. The glands became early affected, and soon there was general infiltration, with great swelling and induration of the whole neck, which presented an appearance resembling the peculiar form of carcinoma of the breast, which the French call “*carcinoma a cuirasse*.” Respiration became much impeded, and the little patient died on the sixth day of the disease from a combination of coma and asthenia.

After the 15th year females appear to be far more susceptible than males, as there is no male among my cases after that age. The number of females over fifteen years was five. Two of these five cases, however, occurred in the same person. Both attacks were incurred by nursing children sick with scarlet fever. The patient had gone through the disease in

childhood, but is peculiarly susceptible to its contagion. When engaged the first time in nursing, she was in a few days attacked with sore-throat and fever, and a faint rash. Six years later, when she had nursed several children in scarlet fever of a very malignant type, she again had sore-throat and enlargement of the glands in the neck, with fever but no rash. The majority of my cases occurred during the first ten years of life, in the proportion of 44 out of 58.

Sex appeared to exercise some influence, more male children being attacked during the first ten years in the proportion of 25 males out of 44 cases. After the tenth year the susceptibility of females seems to be much greater than that of males, for of the 14 cases which occurred between the ages of 10 and 33 there were only 3 males, and these below 15 years, the other 11 cases were females. But even in females the susceptibility diminished greatly with advancing age, for among the 11 cases which occurred between the 10th and 33d year, 8 were in patients under 16.

It was generally found that the disease was lighter in proportion to the age of the patient. In this respect scarlatina presents a striking contrast to measles, which is, as a rule, lighter in the very young, and assumes a severe type in adults. The patient, whose case is marked in the table as having occurred in her 23d year, was a robust servant girl of florid complexion, her general health had always been good. She had no remembrance of having scarlet fever as a child, and did not believe she had had the disease. The attack was not ushered in with vomiting, but there was a slight rigor, and the temperature quickly rose to $105\frac{1}{2}^{\circ}$ Fahr. The rash appeared late on the first day; it soon became uniform and of intense scarlet hue. There was but little throat trouble. The desquamation was excessive, and protracted to the sixth week. During the height of the disease there was slight albuminuria, but casts were not found at any time.

I have already mentioned the fact that very young infants are not so susceptible as children between two and ten years. In the family of Mr. G. two of the children had scarlatina, but the youngest daughter, an infant of about eighteen months, though brought in daily contact with the patients, escaped it. Mr. B.'s five children had scarlatina, but an infant about eleven months, who slept in the same room with two of the patients, and was in daily and close contact with them, entirely escaped. Many other cases of the kind might be adduced. A large number of individuals are not at all susceptible to scarlatinous infection, and may expose themselves to it without danger. In some this immunity is permanent, and lasts through life. In others it wears out, and the individuals, after having over and over again been exposed without effect, become all at once susceptible to infection, and contract the disease. In a majority of instances one attack of scarlatina destroys the susceptibility of the patient, and though he may afterwards often be exposed to the disease he never contracts it again. But almost every physician has observed cases of a second attack

of scarlatina in the same person, and a third attack even has been observed. These subsequent attacks are not always modified by the first, but may even exceed it in severity and the gravity of the complications. An illustration of this is seen in the following case :—

CASE III.—W. M., at the age of six years, had a rather severe attack of scarlatina, with marked throat trouble, coryza, and suppuration of the ear, and an extensive bronchial catarrh. After this he on several occasions came in contact with the disease, but did not again have it until he had passed through his twelfth year. The younger children in the family then suffered from a severe type of scarlatina, and he had the disease a second time, and came very near dying from scarlatinal nephritis. This case will be mentioned again later on. In another case the susceptibility returned much more quickly; the patient was a girl of ten years, and was the first in the family to contract it. Eight months later, after it had gone through the family, she had a second attack, so well marked and characteristic as to leave no room for doubt as to the correctness of the diagnosis. No other explanation of this second attack suggested itself than that the protective influence of the first attack having been exhausted, she became again infected by miasm, remaining in the house from the time when the other members of the family had the disease.

The miasm of scarlatina certainly retains its vitality and power of mischief for a long time, as will be shown by the following case, and I am aware that many other instances have been recorded in which infection occurred after a much longer interval.

CASE IV.—Mrs. — with her son, aged 3 years, went to a watering place for a few weeks. She was assigned to a room which three months before had been occupied by a patient having scarlatina. Her child in a few days developed the disease, and died of it in a week.

The most frequent mode of infection, I believe, is by breathing the air of a chamber occupied by a scarlatinous patient, but it may also take place without direct communication with a person having the disease. There can be no doubt that persons may carry scarlatina to others without becoming affected with it themselves. Many cases of the disease in physicians' families originate in this way. A medical friend of mine thus became the medium of infection to his child. A good many years ago I was attending a case of scarlatina and a week later, my own child, who, as far as could be ascertained, had not been exposed to infection in any other way, became affected with the same disease. I have never been able to convince myself that in my own cases the miasm had gained entrance to the system in any other way than by the pulmonary mucous membrane.

The atmosphere may, however, I believe, be contaminated not only by the air exhaled by scarlet-fever patients, but also by the secretions, especially the urine, which, as already shown, contains large quantities of the miasm, the *plax scindens*. It is possible that the intestinal evacuations may also contain the miasm, but of this I have never satisfied myself; if

examination should demonstrate that they do, it is likely this excretion may also give rise to infectious emanations. The blood being charged with great masses of the miasm may of course in case of hemorrhage occurring in scarlatina become a medium of infection. On drying and becoming reduced to powder the blood easily gives up the miasm, which, being very minute, is carried by the atmosphere.

There still remains a large number of cases in which infection of the patient by another person having scarlatina, either directly or indirectly, cannot be assumed. These were, until recently, supposed to be instances of a "de novo" origin of scarlatina. It is to the elucidation of this class I would apply the study of the origin and nature of *plax scindens*, although it will be found that this study as shown by Eklund is capable of furnishing important indications for the prevention of scarlatina as well as of throwing light upon its origin and mode of propagation. But here again my own experience fails me, and I must quote the observations of my distinguished friend Dr. Frederick Eklund, of Stockholm. His researches have been so profound and exhaustive and are so pregnant with important practical results that I could hardly avoid alluding to them. It has been ascertained by him that the *plax scindens* is among the most common vegetable parasites found in the soil, in water, on mouldy walls, and on mouldy wall paper. He found innumerable masses of this parasite on making microscopical examinations of the soil and water of muddy places, and of the excavations dug for the purpose of laying water pipes.

Scarlatina immediately broke out among the children of a family living close to the place where the earth had been dug up in order to lay water pipes, and who could not help breathing the exhalations from the water evaporating from these excavations during the warm summer days. A child falls into the mud while playing, the soiled clothes are hung to dry and are afterwards beaten and brushed within doors; soon afterward he has an attack of scarlatina. The explanation is not doubtful. The parasite contained in the miry soil has entered the house, and has been set afloat in the atmosphere with the fine dust brushed out of the clothing. The air breathed by the child is laden with great numbers of it, and once within the organism its irritant effects in due time declare themselves. I regret that other duties have prevented me from verifying by my own observations these researches of Dr. Eklund, relating to the origin of *plax scindens*.

They certainly furnish a natural and plausible explanation of the origin of scarlatina, where, without it, one would be obliged to admit that this disease, at times, occurs independent of infection. This would involve the rather awkward assumption that the cause of a specific disease is sometimes specific and sometimes not. As previously stated, I have never seen a case where I thought the infection of scarlatina had entered the organism in any other way than by the lungs, but as suggested by Dr.

Eklund, the drinking of milk which has been diluted with water containing the *plax scindens* may well be admitted as a cause of scarlatina, especially since the published observations of Bell and Taylor, in England, have shown that scarlet fever may originate through the medium of infected milk.

The *plax scindens* multiplies by fission and belongs to the order of schizomycetes or cleft-fungi. Great warmth favors this process; it is therefore but natural that the heat in the interior of the body should furnish most favorable conditions for the rapid increase of the parasite when it has once gained an entrance into it, and the blood and secretions soon become richly charged with it and then with fine mycelial filaments.

It is held by many that the epidermic scales shed so abundantly by scarlet-fever patients during the period of desquamation contain the infectious principle of the disease, and some believe that it is most infectious during this period. My clinical studies do not confirm this view. When scarlet-fever has broken out in a family I have generally found that one or more of the other children were attacked before desquamation had begun in the person first taken sick. It has appeared to me that the infection was strongest during the height of the fever and during the period the parasite is found in largest quantity in the urine. The desquamation is a result, a sequel of the disease, and is commensurate with the antecedent inflammation of the skin. In other kindred diseases infection is most active while the morbid process is most intense, not after it has come to a close. It is difficult to say how long infection may linger about the person after he has passed through scarlet fever, and how long his immediate surroundings may continue charged with the parasite. I cannot believe that the epidermic scales contain it, for I have repeatedly subjected great numbers of them to microscopical examination without ever finding it. The *plax scindens* is so minute and is present in such large quantities that it may attach itself to clothing, furniture, wall paper, ceiling, carpets, books, etc., and one can well understand how easily it may adhere to rooms and persons, and how readily it may be wafted about by air currents and in that way spread infection, without invoking the shedding scales of epidermis to explain its propagation.

Pathology.—This embraces first, the morbid process, and second, the anatomical changes and the morbid phenomena or symptoms which result from them.

The morbid process in scarlatina is believed to be due to the irritating presence of the *plax scindens*, but the primary steps in this process are necessarily unknown. It is not possible to say with certainty upon what tissues or upon what system, whether vascular or nervous, the irritation is first exerted. From the fact that scarlatina is ushered in, generally, with symptoms of great disturbance of the nervous system, it may be assumed that the latter is primarily acted upon. Eklund (*loc. cit.*) believes that

the rotatory and terebrating motion for which the little parasites are noted could hardly avoid having a disturbing influence upon the vasomotor ganglia and the terminal filaments of the great sympathetic. But actuated by a prudent reserve, he forbears expressing an opinion whether this disturbance be of "irritating or paralyzing nature." That the blood is in some way altered by the presence of the parasite is probable, but whether directly or indirectly, or exactly in what manner, is unknown. The scarlet color of the skin is due to intense congestion and inflammation of this structure which may be presumed to be due to the irritant pressure of the parasite.

Fever as intense as the fever of scarlatina may be induced by an equally extensive and intense, but non-specific inflammation of the skin. But as the fever in scarlatina often precedes the cutaneous affection by twenty-four or even forty-eight hours, and as the latter may even be entirely absent, it is most likely they both depend upon a common cause.

Early development of the fever, its intensity, and with certain qualifications, its duration, are a measure of the energetic action of the parasite and of the profound implication of the nervous system.

The morbid process appears to be self-limited so that after running its course it comes to a close spontaneously. On its completion the organism, though in outward appearance restored to its pristine condition, will have undergone a more or less enduring change; for it is, in the majority of instances, no longer capable of being acted upon in the ordinary way by the scarlatinal miasm. What this modification exactly consists in, by what intimate alterations of tissues it is attended, is entirely unknown.

It requires a certain length of time for its accomplishment, and this length of time constitutes the duration of the disease, unless cut short by death or protracted by complications.

In estimating the duration of scarlatina I have deducted the fatal cases and complicated cases which recovered. This was necessary, in order to arrive at a correct view of the normal duration of scarlatina, the importance of which can hardly be exaggerated; for without this knowledge it is impossible to determine whether any particular plan of treatment influences the disease favourably or unfavourably, whether it shortens or lengthens its course.

Fifteen cases terminated fatally, and three cases which recovered had serious complications, making a total of seventeen cases which are to be deducted from the whole number of recorded cases. The duration of the remaining forty cases will furnish the average duration of scarlatina in its various forms, so far as any generalization may safely be based upon so limited a number.

The rule adopted by me in estimating the duration of the disease was to date its beginning from the inception of fever, and its close from the disappearance of fever with marked improvement in leading symptoms.

Perhaps it may be objected that the exact beginning of the fever cannot always be ascertained, and that therefore it would be better to count from the occurrence of the chill or the setting in of vomiting; but both these may be wanting, and the chill, especially, was frequently unobserved among the youngest of my patients. I have therefore preferred the rule mentioned above. According to this mode of calculating it was found that the average duration of the disease in forty cases was six and one-sixth days. The minimum duration in a very slightly marked case was three days; the maximum duration was fourteen days. The latter was an unusual case: the most careful and persistent examination failed to discover any complication, no local mischief ever developed, and the long duration of the fever, which was entirely uninfluenced by quinia, seemed to be entirely due to a more protracted blood poisoning. The child was in perfect health up to the time she was taken sick of scarlatina, and was unusually well developed and vigorous. A similar case, but in which the fever did not last more than ten days, occurred in a boy.

Pathological Anatomy.—Under this head I wish to present some facts collected by clinical observation, and others noted at post-mortem examinations. The former will be limited by the number of my recorded cases, the latter are necessarily few; for all my cases occurred in private practice, and an autopsy could but rarely be asked for, and was still more rarely permitted.

In studying this clinical material the cases were arranged in several classes, according to the grouping of symptoms. The old classification into three forms, *S. simplex*, *S. anginosa*, and *S. maligna*, did not appear altogether practical or satisfactory. Many cases occur which cannot be properly said to belong to the first variety, although the violence of the disease certainly appears to expend itself upon the skin, and those in which the kidneys are chiefly affected do not, properly speaking, belong to either of these three varieties. The cases were, therefore, classified as follows:—

A. The cases in which the skin affection was the most prominent feature. They differed widely, and were classed:—

1st. Those in which there was moderate eruption, and not excessively high fever.

2d. Those in which there was intense eruption and high fever.

3d. Those in which the eruption, at first simply a strongly marked scarlatina rash, became vesicular or later even pustular.

4th. Those in which the eruption was hemorrhagic.

B. The cases in which the throat affection was the most prominent feature. They were found to differ according to the degree of intensity of the throat trouble, the degree of fever, and the presence or absence of eruption.

C. The cases in which pyrexia was the chief symptom, and in which the nervous system was profoundly implicated.

D. The cases in which the kidney affection was the most conspicuous feature.

On analyzing the cases, the class in which the skin affection constituted the most prominent feature is found to compose the majority, being forty-one out of fifty-eight. Of these forty-one cases twenty-eight were characterized by moderate fever and eruption, ten had intense eruption and high fever, one had an intense fever which became vesiculo-pustular, and two had intense fever with an eruption which I have designated as hemorrhagic, although there were no hemorrhages from internal organs, which have induced some writers to describe a variety of scarlatina under this name.

All the twenty-eight cases belonging to the first subdivision recovered, except one in which septicæmia occurred as a sequel. This case will be mentioned in detail later on. In eleven of them there was slight albuminuria during the height of the fever. The urine, however, contained neither blood-cells nor casts, and was not "smoky." The amount of albumen was very small, and was present only from twenty-four to sixty hours. As there was no other indication that the kidneys were implicated, the albuminuria was regarded as dependent upon some transient modification of the renal secretion but wholly unconnected with any inflammatory change in these organs. In only one instance among those who recovered did the fever continue after the rash had entirely passed away. This case has already been mentioned as lasting fourteen days.

CHART I. (A. T., æt. 7., moderate eruption and fever.)

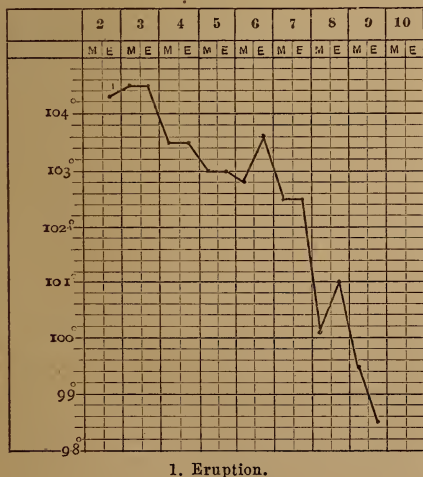
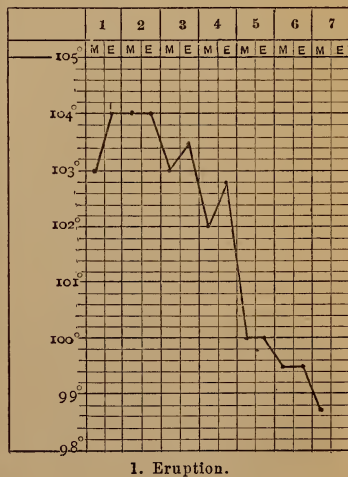


CHART II. (H. B., æt. 8., moderate eruption and fever.)



In fifteen cases the disease was ushered in by vomiting, and the temperature rapidly reached the fastigium. Drowsiness was noted in all the cases during the pyrogenetic stage. Spontaneous diarrhoea occurred in nine cases toward the close of the eruptive stage. In seven there was observed a more or less marked rigor, initiating the attack, but only in the older children. Temperature charts (I. and II.) are appended, illustrating the course of the fever in two cases belonging to this class.

The second subdivision, characterized by intense fever and eruption, includes ten cases, whose ages were respectively two years, four, six, six, six, eight, eight, twelve, twelve, and twenty-three. All these patients also recovered, but several had complications of more or less serious nature. W. M., æt. six years, had severe general bronchitis, inflammation of throat and ulceration of membrana tympani with protracted otorrhœa. F. M., æt. two years, had slight convulsion before the rash appeared. S. J., æt. four, had a moderately severe pneumonia and albuminuria without casts, and the pyrexia lasted ten days from day of first visit. The patient aged twenty-three years has already been alluded to. Charts giving range of temperature and duration of fever in some of these cases are appended.

CHART III. (S. J., æt. 4.)

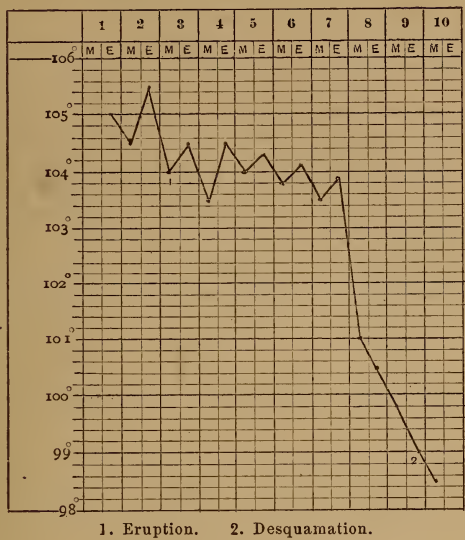


1. Eruption. 2. Albuminuria. 3. Pneumonia at base of lung.

In this case (Chart III.) the fever was intense, and the occurrence of lobar pneumonia did not seem to interfere with the progress of the disease, its accession was not marked by a higher rise of temperature than had been observed the previous night.

The eruption in the next case (Chart IV.) may have developed during the night of the second day, but was not observed until the morning of the

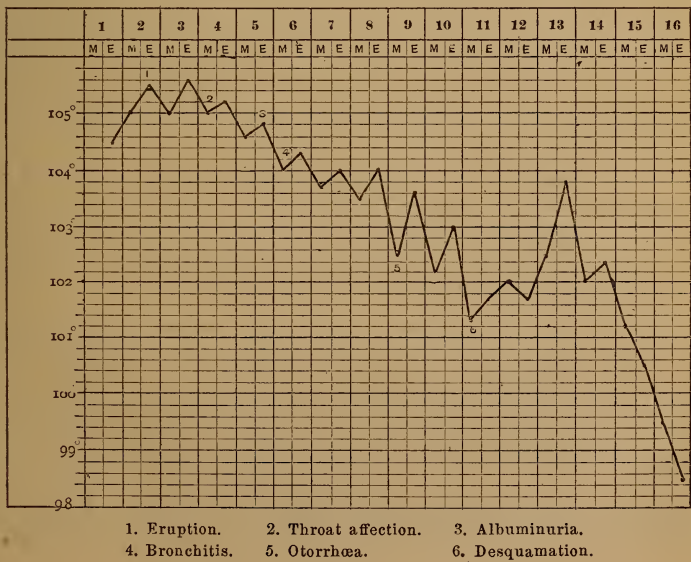
CHART IV. (Ellen C., æt. 15.)



third day. The eruption began fading on the seventh day, had disappeared by the ninth day, and desquamation set in by the tenth day, and was very abundant.

CASE V.—In this case (Chart V.) the eruption appeared on the second day in the evening, and soon became general; it was of intense scarlet color.

CHART V. (Case V. W. M., æt. 6 years. Intense pyrexia, quite protracted, complicated with angina, suppurative otitis, and general bronchitis.)



The throat affection had become troublesome by the fourth day, and consisted of ulceration with great swelling of the tonsils, the glands in the neck were greatly enlarged, and there was coryza with an acrid irritating discharge. Bronchitis which became general and severe declared itself on the sixth day. On the ninth day pus began to flow from the external meatus of the left ear. Desquamation set in on the eleventh day, the rash having disappeared two days before. The pyrexia had not come to an end until the sixteenth day, and the convalescence was tedious and protracted; desquamation was excessive and continued for weeks. Hearing of left ear permanently injured by ulceration of membrana tympani. Albuminuria was present though only in small degree, beginning on the fifth day, and continuing for a few days.

CASE VI.—The eruption became vesiculo-pustular in one case only. This was a female child of four years, both father and mother unhealthy. The disease was ushered in with vomiting; drowsiness, transitory, and not very marked, in the beginning. Rash appeared on the second day of fever; it was attended by an unusual degree of itching, and became intense and general. At the close of the third day the patient was so covered that one could not find the smallest space of normal colour upon the integument of the trunk. By this time a large number of vesicles made their appearance, first upon the chest and abdomen, and then upon the sides and back. The extremities were not invaded to the same extent, yet numerous vesicles were scattered over their surface. On the fourth day these vesicles had assumed a yellowish tint and had evidently puriform contents, and the surrounding skin still retained the same intense scarlet hue. It was apparent that the functions of the skin were in abeyance and the little patient showed signs of approaching coma. There was some lividity of the lips, the finger nails became bluish, and it was impossible to keep her awake for more than a few moments at a time. The fever continued, the throat was not much affected, and the glands in the neck were not perceptibly enlarged. Albuminuria was present the third, fourth, and fifth days. The tincture of the chloride of iron was given internally, and under the application of cloths wrung out of tepid water the action of the skin was restored, and the fever went down so that the patient was convalescent on the seventh day, but very feeble. Desquamation was prolonged and abundant. Although the issue was favourable this patient was for forty-eight hours in a very alarming condition, and it has always seemed to me made a very narrow escape with her life.

The last subdivision of the class of cases in which the skin affection was the most conspicuous feature includes those in which the latter assumed what I have called the hemorrhagic type. Two instances of this kind occurred in my fifty-eight cases. Both terminated in death, though not in the same manner.

CASE VII.—Lee A., aged five years, was a fine large boy, perfectly healthy and strong up to the day he was taken sick of scarlatina. There were indications from the very outset that the disease would be severe. The vomiting, which was the initial symptom, was quickly succeeded by great drowsiness, high temperature, and diarrhœa. The rash appeared at the usual time, but was characterized by excessive redness, and in twenty-four hours became universal. Delirium set in already on the third day. The pulse was very rapid, small, and irregular. There was, however, comparatively little throat trouble. But the rash, in spite of the patient's

alarming prostration, became more intense, the hyperæmia of the skin was excessive, it assumed a purplish hue, the surface became rough and coriaceous, from infiltration; the epidermis became raised in thick scales not unlike ichthyosis, effusions of blood rendered the skin darker and thicker, and in some places were petechiæ. High pyrexia, profound ataxia, intense eruption, delirium, and diarrhœa were the most striking symptoms. The tongue presented the characteristic "strawberry" appearance, by some called "cat's-tongue," but it soon became dry, covered with sordes, and fissured. Death ensued from asthenia on the sixth day. In this case the patient was overwhelmed by the disease from the very first, and although the skin was the seat of the most conspicuous alterations, still the profound ataxia, uncontrollable delirium, and excessive diarrhœa showed how pervasive and violent was the action of the morbid agent.

CASE VIII.—The other case was a boy, æt. twelve. The disease began without any indication of unusual severity. The rash was first noticed on the morning of the second day, with a temperature of 104° which, however, rose to $104\frac{1}{2}^{\circ}$, and, during the night, attained 105° . The rash simultaneously became more extensive and of a deeper red, until the hyperæmia reached the highest degree. The skin now became rough from partial detachment of epidermis by infiltration and effusion of blood, which latter made the skin still darker in places. In spite of full doses of salicylic acid and salicylate of soda, the temperature rose, and on the fifth day stood at 110° , when a sudden convulsion occurred, in which he died.

In this case the blood poison appeared to develop during the progress of the disease a steadily increasing virulence which expended itself upon the skin and excited a hyperpyrexia which proved fatal.

The second group includes the cases in which the throat affection was either the most or a very marked feature. Eight cases constitute this group, and they represent both very mild and very grave types of scarlatina and some of the most disastrous complications. The respective ages were 1 year, $1\frac{1}{2}$ year, 4 years, 6 years, 8 years, 10 years, 11 years, 26 years, and 32 years.

The last two of these represent two attacks of scarlatina in the same patient, contracted while nursing scarlatina patients on two different occasions with an interval of six years between each attack. The patient had never had the disease during childhood. The first attack was characterized by fever, ulcerated sore throat, and an indistinct scanty eruption which appeared but for a day. The second attack was a veritable scarlatina "Sine Exanthemate;" no rash appearing, the sore-throat being however very well marked, with fever, headache, backache, and general prostration. Two other cases with diphtheritic sore throat recovered, after a long and tedious convalescence. The remaining four died. Girl aged one year six months died of asthenia in connection with diphtheria. Boy aged one year died of coma and asthenia with the most extensive infiltration of neck I have ever seen. This case has already been alluded to on page 22.

The third case occurred in a boy of ten; there was intense fever and

extensive infiltration of neck, the tonsils were excessively swollen, he died on the fifth day from cedema glottidis.

The fourth fatal case occurred in a girl aged eleven years. The inception of the attack was not attended with indications of the danger which soon crowded the brief record of her disease. It is true the temperature was $104\frac{1}{2}$ and remained high, showing that it was not a light case. Severe sore throat developed with extensive infiltration, abscesses formed in both sides of the neck, which were lanced. Suppurative otitis set in and the little sufferer became deaf. Pericarditis and pneumonia successively occurred and the patient suddenly died from heart clot.

The third group was composed of cases in which intense pyrexia was the most conspicuous feature and the nervous system was profoundly implicated. They were six in number, and their respective ages were as follows; 1 year 11 months, 3 years, 3 years, 6 years, 6 years 6 months, 12 years. Every one of them died.

CASE IX.—The first of these was a girl 6 years old, of healthy parentage, and perfectly healthy prior to this illness. She had a few days before been exposed to contagion in school. In apparently perfect health she was observed to have fever, and all at once had convulsions, which continued to recur with great violence for six hours, at the end of which time she died. The fever rose with the progress of the disease, and had the thermometer been then in use, the temperature would probably have been found excessively high. There was no rash, and the fatal termination took place before the time for its appearance. After death the body was seen covered with extensive ecchymoses. The extreme violence of the disease expended itself in this case upon the nervous system, which was completely and fatally overwhelmed by it. It is the most rapidly fatal case of scarlatina I have ever seen, and the name "scarlatina fulminans" might be very appropriately employed to designate it.

CASE X.—Two other cases occurred in one family during a remarkably malignant epidemic. They were both girls, aged respectively 3 and $6\frac{1}{2}$ years. The younger was first taken sick. The temperature was not excessively high at first, but did not in the least abate during the first four days. There was moderate sore throat with coryza and a very acrid discharge. On the fifth day the temperature rose to $105\frac{1}{2}^{\circ}$, and oscillated between this figure and 104° until the twelfth day, when she died. A rather pale and scanty eruption appeared at the end of the second day, but every trace of it had disappeared within forty-eight hours. The pulse was excessively rapid and feeble from the first, and, in spite of free stimulation, could not be improved.

CASE XI.—The older sister was taken sick several days later than her sister, and presented a typical case of scarlatina ataxica. Vomiting, followed by profound prostration, ushered in the attack; she was very pale, pulse too rapid to be counted, temperature 104° . No sign of rash could be discerned, and death took place in thirty-eight hours. In the younger sister high temperature and great disturbance of the nervous system contributed to bring about the fatal result. In the older, who had been up to that time remarkably healthy and strong, the temperature was not excessively high, and the disease did not last long enough for the effects of intense pyrexia to ensue. The disease seemed to act in a shock-like

manner upon the nervous system, which never gave the least sign of rallying from the onset to the close of the attack.

The fourth and fifth cases were similar to the one last described, though less rapid and intense.

CASE XII.—The older of these two, a boy, *æt.* 3 years, family history bad; had a faint rash; temperature 104° to 105° ; died of exhaustion on the seventh day. The evidences of nervous prostration were marked from the first.

CASE XIII.—The younger, a girl, *æt.* 23 months, was suddenly seized with vomiting and fever, and in a few hours a faint rash appeared, which quickly receded. Temperature varied from $103\frac{1}{2}^{\circ}$ to 105° ; death ensued in seventy-two hours. Great pallor, small, excessively rapid, irregular pulse, and utter prostration were the most prominent features of this case.

CASE XIV.—The last in this group was a plump, rosy-cheeked girl, aged 12 years. The attack began with a chill followed by high temperature and a dry, burning skin. On the second day a typical rash appeared, and in twenty-four hours she was well covered with it. The temperature stood at $104\frac{1}{2}^{\circ}$, and under the use of salicylate of soda it fell to 102° . She manifested considerable excitement on the fourth day and complained of headache and intolerance of light. During the night she became wildly delirious. Acute meningitis had developed, and on the sixth day convulsions set in, and death ensued a few hours later.

The group in which affection of the kidneys was the most conspicuous feature embraces three cases, one of which was a girl, aged 4 years, the other two were boys, aged 5 years and 13 years respectively. The latter recovered, the girl and the younger boy died.

CASE XV.—On page 31 has been given a brief sketch of this boy's first attack of scarlatina, during which his throat and ears were seriously affected; he had besides a widely diffused bronchitis. In 1874 he had diphtheria, followed by paralysis of the soft palate and of the lower extremities. In 1875 two of his sisters had scarlatina of a malignant type and died. At this time the boy had a severe ulcerated sore throat, attended with considerable swelling both externally and internally, and voice and deglutition were greatly impaired. The fever lasted a week and reached 103° . No rash could be discovered at any time, though carefully looked for. The case was nevertheless regarded as scarlatina. By the end of the week he had become quite feeble, and his pallor was so marked and peculiar as to suggest renal trouble. His mother noticed that the eyelids were swollen of a morning, and this swelling speedily involved the face. The urine was smoky, very scanty, albuminous, and contained blood-corpuscles and epithelial casts. Pulse quick and feeble, bowels constipated. Two days later he had headache, *muscæ volitantes*, nausea, and frequent attacks of vomiting. During the night he was seized with violent convulsions and became comatose. He had altogether four convulsions. He was at once placed in a warm hip-bath, the feet were placed in hot mustard-water, and cold water was poured upon his head. The venous congestion diminished under this application, and there were some manifestations of returning consciousness. He was then placed in the cold pack, but not without difficulty, as he resisted with a good deal of force. Power of speech and deglutition having returned, an infusion of

jaborandi was administered in half-ounce doses every half hour. His language was wild and incoherent, but he had now become quiet. Profuse diaphoresis and diuresis were established by morning. Jaborandi was continued at longer intervals, and on the third day the urine was free from casts but still contained some albumen.

It might be objected that the renal disease was in this case a complication rather than a part of the scarlatinal process, but this can hardly be the correct interpretation of the facts. The external manifestations of renal trouble, viz., œdema, extreme pallor, etc., developed so close upon the throat disturbance that the anatomical changes in the kidneys, and the latter must have been going on simultaneously, and the renal affection evidently must have existed for some days before the uræmic effects already mentioned declared themselves.

The younger boy was not seen by me until a short time before he died; his case has already been mentioned on page 19.

CASE XVI.—The last case was the only female child in the group. Scarlatina had already attacked two other members of the family when she was taken sick. She was 4 years of age, had been of average health, and appeared to have considerable vitality. The fever was ushered in with a rigor, and rapidly rose to 104° ; the rash was uniformly distributed over the whole body by the end of the third day; on the fourth day the urine was highly albuminous, and convulsions, preceded by vomiting, and rapidly followed by suppression of urine, set in on the fifth day. Death ensued on the morning of the sixth day.

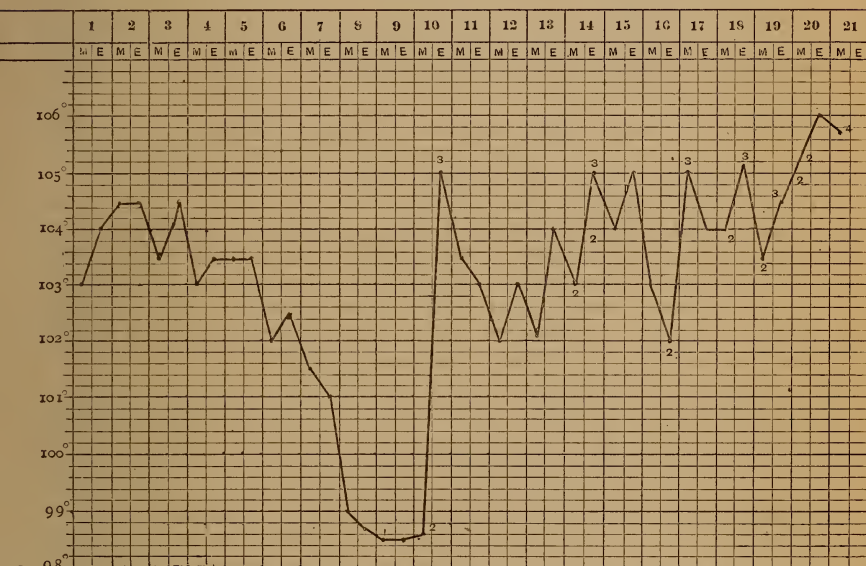
Fifteen, out of the total of fifty-eight cases, terminated in death. The following table setting forth the age, sex, type of disease, immediate cause of death, and day of death, will enable the reader to see the salient points in each case better than in the records scattered throughout these pages.

No.	Sex.	Age.	Type of disease.	Immediate cause of death.	Day of death.
1	Boy	1 yr.	Scarlatina anginosa	Coma and asthenia	6th day
2	Girl	1.6 "	" "	Diphtheria	7th "
3	"	1 $\frac{1}{2}$ "	" ataxica	Exhaustion	72 hours
4	"	3 yrs.	" "	Asthenia	12th day
5	Boy	3 "	" "	"	7th "
6	Girl	4 "	" nephritica	Uræmia and convulsions	6th "
7	Boy	5 "	" hemorrhagica	Asthenia	6th "
8	Girl	6 "	" fulminans	Convulsions	6 hours
9	Boy	6 "	" nephritica	Uræmia and convulsions	?
10	Girl	6 $\frac{1}{2}$ "	" fulminans	Collapse	38 hours
11	"	7 "	" anginosa	Septicæmia	3 weeks
12	Boy	10 "	" "	Œdema glottidis	5th day
13	Girl	11 "	" "	Heart clot	10th "
14	Boy	12 "	" hemorrhagica	Hyperpyrexia, convulsion	5th "
15	"	12 "	" nervosa	Meningitis	6th "

No. 11 among the fatal cases has already been mentioned. As seen in the table, the patient was a girl, aged 7 years, in whom the primary

disease ran a not very protracted course, and was not of unusual severity though of the anginose type. Several days after defervescence had taken place a series of abscesses began to form in the neck, the discharge from them became offensive; there was a recurrence of rigors at irregular intervals, the temperature rose, the pulse and respiration became very frequent, complexion was muddy, there was delirium and diarrhœa, and she died on the twenty-first day. (Chart VI.)

CHART VI.



1. Defervescence.

2. Chills and formation of abscess.

3. Quinia administered.

4. Died.

The mortality in the cases recorded may appear unusually large (15 out of 58), but it must be considered that many of these cases were recorded on account of their severity, or occurred during seasons when the disease was of a peculiarly malignant type.

Morbid Anatomy.—The observations upon the morbid anatomy of scarlatina which I have been enabled to make are embodied in the notes of six autopsies of children who had died of that disease. These examinations were necessarily incomplete, and some of them were very imperfect. They are appended with a full realization of their defectiveness, but yet with the hope that they may prove of some use, as the opportunities for such examinations are rather uncommon with us, and the need of more extensive pathological investigation is generally admitted.

Autopsy No. 1.—White girl, æt. 6. Examination made twelve hours after death. She had died after an illness of only six hours (No. 8, table of fatal cases). The body was covered with livid purple blotches, espe-

cially upon depending parts. On cutting into the skin it was found infiltrated with serosity over the back. Bloody froth was issuing from mouth and nostrils.

Cranial Cavity. Scalp was infiltrated with serum, and vessels on being cut gave forth more blood than usual. Great congestion of intra-cranial vessels, membranes highly congested, sinuses distended with black liquid blood. Brain substance softened. On cutting into it the puncta vasculosa appeared more numerous and larger than normal. Some fluid in arachnoid space of reddish colour, evidently from admixture with blood, but no rupture of a vessel could be found. Ventricles contained some fluid. Spinal cord not examined.

Thoracic Cavity. Lungs dark and mottled, œdematous in posterior portions; large amount of bloody, frothy serum flowed on cutting into them. Bronchial mucous membrane highly congested; bronchial glands large and soft.

Heart. Soft and flabby, somewhat distended with blood, which was black and unusually thin—heart muscle pale, except where it was darkened by post-mortem imbibition of colouring matter and serum of blood. Pericardiac cavity contained hardly any fluid.

Abdominal Cavity. Abdomen swollen, intestine distended with gas, liver large, dark and mottled, large quantity of black blood flowed when it was cut into. Gall bladder distended, spleen large and softened, protruded somewhat beyond costal arch. Kidneys large, highly congested, softer in texture than normal, capsule easily separated, urinary bladder contracted and empty. Case related on page 34.

Autopsy No. 2. (No. 7, Fatal Case, see Table).—L. A., boy, æt. 5. Fourteen hours after death; patient had died on the sixth day of disease. Bloody froth issuing from mouth and nares; a sanious, highly offensive fluid oozing from anus; whole posterior aspect of body of a deep purplish hue. The whole integument except the face of a rough bark-like feel and appearance, with ecchymoses here and there; thick epidermic flakes, edge partially detached, or raised up by dried blood gave the skin this peculiar appearance. On cutting through the integument the deeper layers and subcutaneous areolar tissue were seen infiltrated and œdematous. This patient's case has been related on page 32, as one of scarlatina hemorrhagica.

The cranial cavity was not examined.

Thoracic Cavity. Lungs congested, and œdematous in dependent portions. Bronchial mucous membrane swollen and congested, tubes containing frothy mucus; bronchial glands large and softened. The pericardium containing a small amount of reddish serum, bloodvessels coursing over its surface congested in arborescent patches. No fibrinous exudation; heart paler than normal when blood had been washed out of it, but at first it looked dark; muscular tissue in a state of granular degeneration; valves normal; blood imperfectly coagulated, black and viscid even in left chamber; blood cells were shrivelled and crenated, and the blood contained numerous bacteria and granular debris; liver large and congested; kidneys in the same condition; spleen less so; bladder containing very little urine of a dark colour; intestinal mucous membrane intensely congested and swollen, follicles very prominent, and here and there erythematous patches.

Autopsy No. 3.—This was a case which I had not seen during life, and in which a very incomplete examination was made twenty-four hours after the patient's death. The subject was a male about nine years of age.

There was no sign of eruption, but the skin was desquamating; the abdominal organs only were examined; liver and spleen dark, enlarged, and congested; kidneys large, and of a dark mottled colour, much blood flowed when they were cut into. The small quantity of urine found in the bladder was dark, albuminous, and contained blood cells, fibrinous and epithelial casts. Intestine distended in some parts, other parts contracted; Peyer's patches large, softened, and congested; here and there were erythematous patches.

Autopsy No. 4.—This was a boy 12 years of age, who had died under the care of another physician, through whose kindness I was permitted to be present at the autopsy. The skin was congested and discoloured in spots, especially on the back; lungs somewhat congested in lower and posterior parts; heart contained white, rather firm clots; aortic valves thickened, congested, and with fibrinous bead-like exudation on their free border; pericardium inflamed, and containing a small amount of sero-fibrinous exudation; kidneys congested; bronchial mucous membrane congested; left pleura had some fibrinous exudation.

Autopsy No. 5. (Case 1, Table of Fatal Cases.)—Boy about 1 year old. Sixteen hours after death: cranial cavity and neck were not examined, as positive injunction to leave these parts untouched had been given by the parents. Lungs were highly congested throughout; bronchial membrane in the same condition; heart distended to its full capacity with dark fluid blood. The neck was enormously swollen and indurated; there was no lesion of the skin visible; patient had died by coma and asthenia, the case has been reported on page 22.

Autopsy No. 6. (Case No. 4, Table of Fatal Cases.)—Girl, æt. 3 years; she died on twelfth day of disease of asthenia. Examined ten hours after death; no signs of eruption, skin exceedingly white, only very slight post-mortem discoloration posteriorly; muscular tissue showed granular degeneration, striæ here and there quite obscured or wanting; heart pale and flabby, and with comparatively little blood in its cavities; the blood was fluid in part, the clots were not very firm; there was but little pulmonary congestion except at base; the pleuræ and pericardium were not congested; liver, kidneys, and spleen were congested, bladder was full, and the urine contained some casts, and a little albumen. The mucous membrane of the stomach was congested in arborescent patches, and was swollen and softened; the lymphatic glands appeared larger than normal; the blood was viscid and dark in the abdominal vessels. This case has already been mentioned on page 34 as one of scarlatina ataxica.

Treatment.—Scarlatina is a self-limited disease, whose course there is no means of shortening, but which may be aggravated and protracted by too active and unwise therapeutic measures.

No specific remedy for the effects of the parasite has so far been discovered, no antidote to it has as yet been found, and no method is known to our art by which its departure from the body can be expedited, or its elimination be rendered complete.

The clinical history of scarlatina varies so exceedingly, and successive epidemics differ so greatly from one another, that until the peculiar parasite was discovered, the question was more than once asked if several different diseases had not been included under this one name.

In a large number of cases the disease is so mild that there is no need of treatment. In many other cases it is of such destructive violence, so abrupt in its access, runs its fatal course with such fearful rapidity, that the best efforts of even the most devoted and skilful will avail nothing. Yet there is a very large intermediate class, where the physician will find an ample field for the exercise of his art.

In entering upon this part of the subject two methods of dealing with it presented themselves. One was to give in connection with each case a detailed account of the plan of treatment pursued; the other was to simply set forth the conclusions which had been reached, and which appeared justifiable or actually demanded by my clinical experience. According to the former much repetition would have been unavoidable, with much waste of time and space. Besides, it would have been not only tedious and unprofitable, but impracticable, as all the clinical material has not been reported in detail. According to the latter, conciseness and perspicuity would be gained, and the experience gained in the observation and treatment of many other cases besides those forming the basis of this paper could be utilized; therefore this plan was preferred. In all infectious and contagious diseases, the physician's first care must be to prevent their further extension. This, it must be confessed, is not as well done as the importance of the subject demands. In private practice numerous obstacles present themselves, and it is fortunate for mankind that the infection of scarlatina is not more strong, and the susceptibility to it not so general as in the case of measles.

Prophylaxis.—This requires first of all the segregation of the patient whenever scarlatina breaks out in a family. Considerations of convenience, inadequate house room, lack of sufficient help in the house, so as to enable some one to give undivided time and attention to the care of the sick are practical difficulties which every physician will encounter, and which he will often find it impossible to overcome. The most remote chamber in the house should, other things being equal, be selected for a scarlatinous patient. It should be well lighted and ventilated, and the temperature should not be allowed to exceed 75° Fahr. Carpets, hangings, and all unnecessary articles of furniture should be excluded. The vessels used for the excreta should be disinfected and the contents should be speedily removed and destroyed. The walls should have no paper but ought to be painted and varnished, so that they can be easily and thoroughly cleansed. The bed linen ought to be changed daily, and immediately be subjected to a high temperature which destroys the vitality of the infecting agent. After the recovery of the patient, all articles of small value such as comforts and the like should be burned. The hair mattresses, and hair and feather pillows should be cut up, the covers destroyed, and their contents exposed to a sufficiently high temperature before they are made over again. The room itself, when the floors and furniture shall have been

thoroughly cleansed, ought to be shut up and thoroughly disinfected by means of burning sulphur, or the so-called "ozonizing powders" may be employed. The latter are composed of equal parts by weight of oxalic acid, peroxide of manganese and permanganate of potash; the mass is placed in a dish, or in dishes throughout the room, and moistened with water. This method of disinfecting the chamber is quite effective when enough of the powder is used. The doors, windows, and chimney must have been closed.

The clothing worn by the nurse should be burned, and the physician ought certainly not to visit houses where there are unprotected children immediately after leaving the sick-room of a scarlatinous patient. A long ride in the open air and a change of clothing appear to be a very reasonable precaution on his part.

It is highly probable that in future more wide reaching prophylactic measures may have to be enforced as we come to accept the doctrine promulgated by Eklund, and already mentioned in these pages. The possible origin of scarlatina by infection from domestic animals, and the admitted facts that infected milk, etc., may become the means of propagation of the disease, also admonish us that we do but ill fulfil our duties as guardians of the health and lives of communities when we content ourselves with simply prescribing for those actually sick of scarlatina, without investigating the origin of the disease, and endeavoring by all possible means to arrest its further propagation.

The use of belladonna as a prophylactic against scarlatina has long since been discontinued, as it has been shown by conclusive experiments to be entirely worthless. For several years I have prescribed small doses of salicylic acid for the prevention of scarlet fever. Although I believe it has some prophylactic power, yet I am far from certain as to its actual value.

The treatment of the patient should be based upon the consideration of his actual condition rather than upon the name of the disease. In the lightest form of scarlatina no medicinal interference whatever is indicated, and when resorted to at all is rather to satisfy the anxiety of the family to have something done. Some cooling diaphoretic with syrup of marshmallow, syrup of lemons, or syrup of red raspberries, properly diluted, etc., may under such circumstances be prescribed. Ordinary prudence as to diet, quiet, etc., should be enforced.

In the class of cases characterized by moderate eruption and fever, the following plan has been carried out with satisfactory results: The patient should be lightly clad, and not be permitted to have any worsted material next to the skin. Cool or cold drinks in small amounts and at short intervals are not only desired by the patient but are actually beneficial. The diet most suitable is milk; light soups or farinaceous preparations are also admissible. Lemonade is often very grateful to the patient and may

be taken cold. If the throat should be affected to such a degree as to make it necessary, the patient may be allowed to swallow small pieces of ice, and a cold water compress should be applied to the front of the neck from ear to ear. This will often reduce the throat affection in a few hours. When there is much itching and burning of the skin the surface should be gently anointed with olive oil. When the temperature runs up to 104° and over, and remains at so high a figure for any length of time, the external use of cold or cool water in some way should not be delayed. It is the most speedy, certain, and safe agent to accomplish the reduction and prevent the evils of protracted pyrexia. In the way of a prescription the following formula, modified according to the age of the patient and other circumstances, has often appeared serviceable: *R. Potassæ Citratis*, ʒj.; *Syr. Limonis*, fʒiij.; *Spts. Etheris Nitrosi*, fʒj.; *Aquæ Destill.* fʒj.; *M. et S.* Take one teaspoonful every 2 or 3 hours.

In some cases it may be desirable to combine a small dose of tinct. aconite, say half a drop, with each teaspoonful, to be repeated at appropriate intervals. Sleeplessness and nervous excitement may at times require the administration of Tully's powder, or bromide of sodium, and even chloral.

The use of purgatives beyond what may be necessary to keep the bowels in as nearly a normal condition as practicable is contraindicated. One must not lose sight of the fact that there is in scarlatina a strong tendency to inflammations of the mucous as well as the serous membranes, and in many cases a spontaneous diarrhœa sets in towards the close of the disease, which may easily be aggravated beyond what is desirable or even safe to the patient.

Large and spoliative doses of quinia and salicylic acid are to be avoided in this class of cases as not required and capable of mischief, if in no other way, by irritating and disturbing the stomach, and sometimes the bowels.

In the group of cases characterized by intense hyperæmia and high pyrexia, there is greatly increased heat production in the interior of the body, due to implication of the nervous system, while owing to the inflammation of the skin, the heat loss from the general surface is much diminished. The destructive effects of continued high temperature are not slow in manifesting themselves. Under such circumstances the first and most important indication is to reduce the temperature. To accomplish this safely and satisfactorily is not always easy. Salicylic acid, salicylate of soda, and quinia are the most potent agents by which the excessive generation of heat may be lessened. But there are general objections to them all, and there often are special reasons for not giving or continuing to give them in individual cases. To obtain their full effect they must be given in large doses, and the necessity for their administration speedily recurs. They are difficult of administration in very young patients, and their local effects are often irritating.

When given in full antipyretic doses they are spoliative in their action upon the blood and depressing to the nervous system. Hence in a disease consisting in a toxæmia with strong tendency to merge into an adynamic state, they must be resorted to with caution, and their administration must be regulated with sound judgment. I have found quinia the most safe of the three. When giving it at all, I prefer to give three or four large doses at an hour's interval, and then withhold it altogether. During the following twenty-four hours there is usually a fall in the temperature, and when the rise again becomes excessive the drug may be again given in the same way. The same plan will be found advantageous in administering salicylic acid and salicylate of soda. The former of these two is the least eligible of the group. Salicylate of soda has the advantage of being less irritating and unpalatable than the others, and it is often a good substitute for quinia in this disease and for the purpose named.

Of all the means to lower temperature, reduce the hyperæmia of the skin, and restore its activity, cold water is the best. It is strange that even at this late date the application of hydrotherapy to the treatment of the exanthematic fevers should still be regarded as an experiment, and that we should still remain in the bondage of the false pathological conception which regards the cutaneous inflammation of scarlatina as an eruption of peccant humours. It is now one hundred and sixty years since Dr. Hancock, Rector of St. Margaret's, Lothbury, England, published his pamphlet entitled, "*Febrifugum Magnum, or Common Water the Best Cure for all Fevers*," "which contains many sound observations and valuable facts detailed in the quaint language of the time." Ninety-five years have elapsed since Currie wrote upon this subject, and advocated the use of cold water in the treatment of scarlatina. From time to time others have again endeavoured to impress upon the medical profession the great fact that, as a febrifuge, common water is safe, certain, and expeditious in its action. Currie's rule for the use of cold-water ablutions in scarlatina was: "It is invariably safe and beneficial when the heat of body is steadily above the natural temperature, and when there is no sense of chilliness present, and no general and profuse perspiration." Bateman, however, found it sufficient to leave the following instruction with the nurse: "Use the cold-water ablutions whenever the skin is hot and dry." In spite of the teaching and example of these and many others, I doubt if many practitioners at present avail themselves of this important agent in the treatment of this and kindred diseases. My own experience with it has been so favourable that I am bound to speak highly of it, and on reviewing the history of many of my cases I regret that its use was not more frequently resorted to. The manner of application must necessarily vary with the age and condition of the patient, as well as with the type of scarlatina one has to deal with. In some cases immersion in a bath is the best, but this is not always practicable; in others, again,

the patient may simply be wrapped in a sheet wrung out of water at a temperature of 70° Fahr. In others, again, sponging the surface with cold or tepid water, or applying cloths wet with water of varying temperature may be preferred. In two of my patients, whose cases have been given in these pages, the results obtained by means of this agent were certainly most gratifying.

The variety of scarlatina in which the throat affection is the most conspicuous feature often presents great difficulties, especially in young children, who cannot make use of gargles, and always resist any efforts to make topical application of any kind. The swelling of the tonsils and fauces may sometimes be reduced and much relief given by letting the little patient suck ice, which is generally acceptable. The glandular swellings and infiltration of the neck can in many instances be controlled by the use of cold water compresses. When practicable, detergent gargles should be used, and perhaps chlorate of potash with dilute hydrochloric acid and honey dissolved in water is as good as any of the numerous formulæ in vogue at the present day. I have often seen good results from blowing powdered sulphur or benzoate of soda through a quill into the throat when the ulcerative stage has been reached. The early opening of abscesses when present, and the frequent syringing of the meatus with warm water when there is a purulent discharge from the ear, should never be neglected. Hot fomentations should always be applied when suppuration cannot be prevented. Beef-tea, wine, and the tincture of chloride of iron and digitalis are often demanded. The reduction of the temperature and pulse by means of depressing agents, such as aconite and veratrum viride, should never be attempted in this class of cases. The use of such agents is mentioned simply to discountenance it.

When scarlatina is of the ataxic type, with tardy and scanty rash, iron and stimulants are required from the first. I have on various occasions prescribed tinct. belladonna in such cases, but in general without much benefit. It was in this class of patients that Currie obtained such good results from cold affusion, and I have seen cases where the patient was apparently saved by this means. For it must be borne in mind that under such circumstances the temperature usually runs very high, although the skin may be pale and the extremities cold. "The stronger the action the quicker the internal reaction which ensues." (Seguin on Thermometry.)

It is true that extreme temperatures are powerful remedies that may kill or cure; but the class of cases to which I now refer strongly tend to a rapid and unfavourable termination, and it is believed that hydrotherapy constitutes the only hope in otherwise desperate cases.

Carbonate of ammonia has been much extolled as a remedy in scarlatina, and it would naturally appear specially indicated in the ataxic form of the disease, on account of its powerful action as a diffusible stimulant.

I have used it extensively, and have found that in the ordinary run of cases it is not needed, and in those of the most violent type it does no good. Besides it irritates the stomach, and promotes or aggravates diarrhœa, two very strong objections to its use. But it is of value in a certain class of cases in which there is bronchitis or pneumonia, and where the stomach is not irritable, and when there is no diarrhœa. The cases in which there is diarrhœa of any severity require the use of hydrotherapy, and are rarely controllable by any other means.

When the kidneys are involved, I have found the use of dry cups over the loins, the wet pack, and jaborandi to compose the most successful remedies. The case of W. M., reported in these pages, furnishes a good illustration of the beneficial results that may be achieved by the two latter. The infusion of jaborandi has appeared to me more reliable than the fluid extract, but pilocarpine is, under certain circumstances, preferable to either.

Scarlatina hemorrhagica requires a plan of treatment that will lessen the intense cutaneous hyperæmia, and tend to restore the arrested functions of the skin. Cloths wrung out of water at a temperature of 85° or 90°, applied to the surface, and changed every hour or two, prove serviceable in this respect, and are both soothing and refreshing to the patient.

These cases soon show signs of exhaustion, and demand a supportive regimen from the very beginning.

In scarlatina fulminans no treatment does any good. The extreme violence of the attack, and the rapidity with which it proves fatal, afford no time for the action of remedies. Such cases are, from their very nature, hopeless.

ARTICLE II.

A CASE OF LODGMENT OF A FOREIGN BODY IN THE CAVITIES OF THE NOSE, ORBIT, AND CRANIUM, WHERE IT REMAINED FIVE MONTHS; REMOVAL BY OPERATION; SUBSEQUENT TREPHINING FOR PUS IN THE BRAIN; DEATH; AUTOPSY. By HENRY D. NOYES, M.D., of New York.

LEWIS EVERETT AVERY, 19 years of age, living in Sullivan County, New York, a farmer in robust health, was wounded in the face by the explosion of a gun while shooting snipe at five o'clock in the morning of September 18, 1881. By the explosion, the lock of the gun was blown off, and also the piece called the breech-pin, by which the barrel is fastened to the stock. Most of the stock remained attached to the barrel. He was knocked senseless, and his brother, who was a little distance behind him, says that he heard something whiz past as the gun exploded. The boy was conveyed to his home in a wagon, a distance of half a mile, and remained unconscious about four days. A physician was called immediately after the receipt of the injury, who dressed the wounds, and said

that the right eye was destroyed, and also said—quoting from a letter from the boy's father—"that there was something there which he did not understand."

The patient did not vomit after the injury, and when he came to his senses he did not afterwards lose his mind, nor have any delirium. He remained in bed for four days, and was attended by the physician for about three weeks. He soon afterwards came to New York to get advice, and presented himself at the New York Eye and Ear Infirmary on the 5th of October, 1881. In the notes of the house-surgeon it is said that the eye was in a state of general inflammation, and that there was a large scar extending from the middle of the nose outwards and upwards along the inner third of the eyebrow. There was a fistulous opening near the inner end of the brow, and a probe struck upon a hard body, whose character was not verified, and then passed down towards the nose. The suggestion that the breech-pin of the gun might possibly have lodged there was emphatically dissented from by both the patient and his brother. Neither of them believed that it could be possible, and the brother asserted that he heard the breech-pin whiz past him at the time of the explosion.

The eye was in a condition of suppuration, and was treated by warm applications. A free escape of pus occurred from the sinus in the brow, from which also two small pieces of wood came away. The eyeball shrank, the swelling of the orbital tissues abated, the discharge both from the fistula and from the nose gradually decreased, and the patient returned home at the end of about three weeks.

Nov. 25. He returned to the Infirmary for inspection, and there had been a notable improvement in the appearance of the parts; healing had occurred very perfectly, his general health was good, his intelligence unimpaired, and he suffered no inconvenience.

Feb. 8, 1882. He came again to the Infirmary with a view to having some attempt made to repair the deformity of his face.

13th. He was intrusted to my care for the performance of a plastic operation. Not having seen him before, I examined him carefully and found his condition at that time to be as follows: He was a stoutly-built, unimpressible young man, rather slow of speech, apparently in good health, with a deep scar extending from the middle of the fractured and depressed nose along the inner canthus of the right eye upwards and outwards to about the middle of the brow. The upper lid was closed, the palpebral fissure was below the normal level, a fistulous opening existed (see Fig. 1) at the inner border of the eyebrow, the right eyeball was atrophied and immovably adherent to the tissues at the inner portion of the orbit, and from the nostrils there was an offensive discharge, which suggested the presence of carious bone. The nasal bones were badly sunken, and the tip of the nose turned up, as shown by the engraving. On exploring the nasal cavity, by the aid of a mirror and gaslight, a foreign body was discovered in the middle of the right side, which clicked like iron when touched with a probe. The finger passed through the mouth into the posterior naris, came in contact with this body, and the patient submitted to a pretty vigorous attempt at its extraction, when it was seized in front by a pair of strong polypus forceps, and pressed upon from behind with the forefinger of the other hand carried up behind the soft palate. The mass could not be stirred, and I was soon convinced that it extended into the orbital cavity. Nothing more was done at that time, and the case was reserved for operation on the following Friday, February 17. The inten-

tion was to remove the foreign body, and reserve any procedure of a plastic character for a future time. The precise extent and situation of the body was unknown. Its discovery had been a surprise. The patient was etherized. As a preliminary step, the patient being upon the back, the posterior

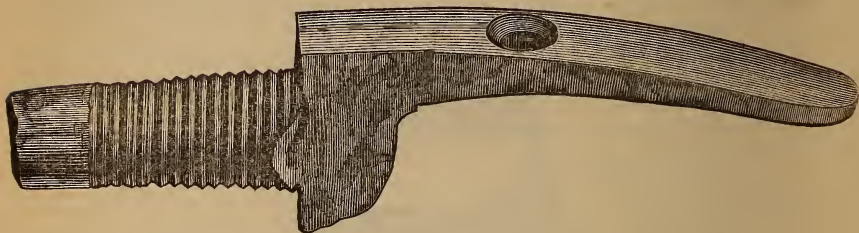
Fig. 1.



nares were plugged with sponges, a proceeding which was accomplished with considerable difficulty, but it was effectual, inasmuch as no blood whatever escaped into the throat during the operation. An incision was made through the scar in the middle of the nose, and the foreign body searched for at the inner side of the orbit. It presented at that point a squared surface about half an inch across, and when exposed was grasped by a pair of common pliers, which took a firm hold of it, but it was immovable. The dissection was carried further up along the brow, and the foreign body was traced upward, outward, and backward towards the roof of the orbit. It was proved that the foreign body was iron, not only by its appearance, but by touching it with an electro-magnet, and in subsequent steps of the operation the magnet was valuable as a means of distinguishing a bony surface from the foreign body when the parts were concealed by blood. The dissection towards the roof of the orbit was made mostly with scissors, guided by the forefinger of the other hand, and it was found that the mass disappeared through the roof of the orbit at its upper and outer angle at some distance behind the lachrymal fossa. At this time an extensive wound had been made into the cavity of the orbit and nose, and the ethmoid cells had been opened, but the foreign body was singularly hidden from view, below the margin of the orbit. In order to expose its lower part, it was necessary to clip away with bone-forceps the edge of the orbit, and at length its full extent was brought to view.

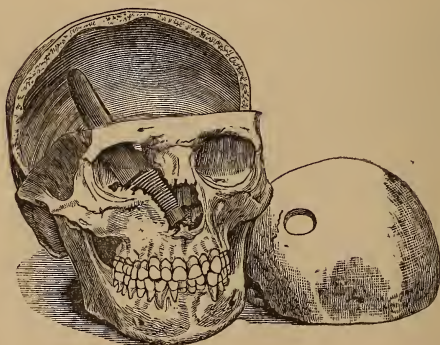
The explanation of the difficulties which were encountered at this stage of the operation is found in the peculiar form of the foreign body, as shown in Fig. 2.

Fig. 2.



The rounded end of the piece of iron, lying in the right nasal fossa, and pressing firmly against its floor, was now seized with the pliers, and gently lifted forwards. It was then caught in a line parallel to its long axis, and with great care very slowly extracted by pulling downwards and to the left across the median lines. It laid in such a position that the shoulder above the cylindrical part rested upon the floor of the orbit. The tapering extremity passed beyond the roof of the orbit to the distance of an inch and a half, namely, to near the place of the screw hole, where it was fastened to the stock of the gun. It proved to be $4\frac{7}{16}$ inches in length, or eleven centimetres; its breadth was about a half inch, or twelve millimetres, and its weight was two ounces, five drachms, and twenty-five grains, or about eighty-four grammes. The cylindrical portion is marked with a thread of a screw, and forms the chamber of the gun, and on one side is a hole, through which the nipple passes. In Fig. 3 the foreign

Fig. 3.



body has been inserted into a skull in the same position which it occupied in the patient. The frontal bone has been taken away, and is placed beside the skull. The round hole in the frontal bone denotes the place where, at a subsequent time, the trephine was applied to reach an abscess in the brain. The shrunken eyeball was next excised, and a free communication established between the apex of the orbit, where the foreign body had been lying, and the conjunctival sac. The wounds through the skin were adjusted, the palpebral fissure, by a little dissection, brought up

to its proper level, and the edges united by sutures. No other attempt was made to correct deformity.

When the foreign body was removed, the roof of the orbit was carefully explored with the forefinger, and the hole in it was so small that it just admitted the tip. When the operation was concluded, the finger, passed through the palpebral opening, could easily touch the aperture in the roof of the orbit. A tent was introduced between the lids back to this point. It was believed that by so doing a sufficient facility for drainage would be secured, inasmuch as the track of the body through the nasal cavity procured another outlet. The operation occupied rather more than two hours, and the hemorrhage was not severe.

It may be remarked that the deep situation which the foreign body occupied, not only concealed it from view, but from exploration by the finger, except in the nasal cavity. The patient had suffered no pain, was entirely free from dizziness, was unconscious of any inconvenience, except the discharge from the nostril and from the fistulous opening in the brow; his intellect was clear, his memory was unimpaired, and in every essential respect he considered himself well. The deformity of his face was the exclusive reason for his seeking advice. He was of resolute character and fair intelligence.

The reaction during the night after the operation was moderate. His temperature was 103° F., and pulse 100. The sponges which had been left in the posterior nares caused him serious discomfort, and they were removed. He was put upon tincture of aconite root one drop and a half every half hour, until eight o'clock the next morning, when his pulse was 90 and the temperature $101\frac{3}{5}^{\circ}$ F. The tent was removed from the orbit, allowing some pus to escape. He had severe pain in the head, and iced applications were ordered. In place of the tent a soft rubber drainage tube was introduced. The aconite was continued.

19th. Second day after the operation. Pulse 72; temperature 98° F. Has slept well. Is comfortable.

20th. There is considerable swelling of the parts. The orbital cavity was well syringed out with a two per cent. solution of carbolic acid. There is only a slight discharge from the nose.

22d. At 6 A. M the temperature $99\frac{3}{5}^{\circ}$ F., and pulse 72. At 4 P. M. the temperature $100\frac{1}{2}^{\circ}$ F., and pulse 68. The tongue dry and covered with sordes. The bowels constipated. Ordered a saline laxative and sweet spirits of nitre.

23d. At 8 A. M. the temperature was $101\frac{1}{2}^{\circ}$ F.; pulse 62, and irregular. The patient was drowsy and indisposed to talk. The tongue was covered with a dry brown crust, sordes upon the teeth and roof of the mouth. The patient had no appetite, and complains of pain in the occiput. Rubber bag filled with ice applied to head.

To-day the patient was seen in consultation by Dr. R. F. Weir. It was suggested that pus might be retained in the apex of the orbit, and an exploration of the parts through the palpebral opening gave vent to a small quantity.

The wounds in the skin had been opened on the *third* day, and gave vent to secretion, and to-day, the sixth day, the cavity of the nostril was easily accessible through the operation wound. In order to provide a more free escape of matter, a hard-rubber Eustachian catheter, considerably curved, was passed up along the track which the foreign body had occupied towards the roof of the orbit, and left in position. In the evening the

pulse was irregular and the lethargy continued. After some hesitation as to the proper course to be pursued, it was decided to give stimulants, and beginning at 8 P. M., a teaspoonful of whiskey was administered every hour until 11 o'clock. The ice-cap was continued to the head.

24th. The patient has experienced some relief from the measures employed, but his pulse ranges from 68 to 58, and his temperature from 100° F. to $99\frac{3}{5}^{\circ}$ F.

25th. Temperature $99\frac{3}{5}^{\circ}$ F.; pulse 54. Appetite improving, expresses a desire for fruit. His diet consists of milk, eggs, and beef-tea.

26th. Temperature 99° F.; pulse 52. Continues to take stimulants and milk. The wounds emit a fetid discharge. From the second day after the operation, the cavity of the orbit, the track of the wound, and the nostrils, were washed out with a two per cent. solution of carbolic acid two and three times daily, and great pains were taken to secure perfect cleanliness.

March 1st. Temperature 99° F.; pulse 60. Gave ether and made a free division of the tissues about the inner canthus, and passed a large silver probe along the track of the wound through the orbital plate into the brain and gave exit to some pus having a fetid odor. A curved hard-rubber Eustachian catheter was introduced as a drainage tube and left lying in the nostril and another one passed through the palpebral fissure.

2d. Temperature 99° F.; pulse 54.

3d. Temperature 99° F.; pulse 52. Feeling convinced that suppurative inflammation was taking place in the brain, with the assistance of Dr. John P. Gray, of Utica, Dr. R. F. Weir, Dr. T. T. Sabine, and Dr. E. G. Loring, ether was administered, the orbit entered by an extensive incision through the upper lid just below the brow, the finger introduced into the hole in its roof and the plate of bone broken away with forceps and a rongeur. The dura mater was crossed by a thickened band of tissue, and a feeling of fluctuation was distinctly recognized. The dura mater was freely incised upon the finger as a guide, and a small quantity of very offensive pus escaped. While giving the ether, it was noticed that the patient used the right arm in his struggles much more freely than the left, and this was the first time that any paralysis had been observed. Besides the pus removed by incising the dura mater, some fragments of bone were taken out. A soft-rubber drainage tube was passed through the opening in the roof of the orbit, and the outer end secured to the skin of the cheek by a stitch.

4th. The wound has been syringed out, the tube removed and cleansed and replaced three times a day. The patient complains of pain in the back of the neck, and right shoulder and arm. The paresis of the left forearm and hand remains unchanged. The bowels were moved by stimulating enemata. Poultices are being applied about the orbit. The patient eats ice-cream freely. From the 25th of February to this date the patient's lethargy has disappeared.

5th. Temperature ranges between $99\frac{1}{2}^{\circ}$ F. and $100\frac{4}{5}^{\circ}$ F.; pulse from 68 to 105, reaching 96 at midnight. Paresis of the left forearm and hand continues. Dr. E. D. Janeway examined the patient in consultation, and found the following symptoms, namely: paresis of the extensors of the wrist and fingers of the left hand, the grasp of the left hand twenty-five per cent. weaker than that of the right; supination and pronation weakened, but the extensors appeared to be more powerful than the flexors. The muscular power of the left leg was impaired, and during the examination

paresis of the left side of the face made its appearance. He thought that the lesion in the orbital convolutions had extended to the medullary matter of the *second* and *third* frontal convolutions, and that the paresis depended upon an œdematous condition of the medullary substance rather than upon a distinct abscess; the left half of the tongue was paralyzed as well as the face. The absence of all convulsive movements upon the paralyzed side was regarded as evidence against meningitis, and Dr. Janeway thought that the cortex was not involved. He regarded it as probable that an abscess existed in the vicinity of the place where the foreign body had been lodged.

At 3 P. M. consultation was held with Dr. H. B. Sands, Dr. T. T. Sabine, and Dr. L. A. Stimson, and it was decided to trephine the skull and search for an abscess. The place decided upon at which to open the skull was in accordance with the views Dr. Janeway expressed concerning the probable pathological condition of the brain. The patient was etherized and the trephine used at a point three inches above the external angular process of the frontal bone, just in advance of the coronal suture; this was in front of the middle meningeal artery, and intentionally anterior to the motor tract. The dura mater was not injured by the trephine. It pressed upward into the hole, but *no pulsation* could be observed. It felt firm and rather tense. A crucial incision was made through it, and the surface of the brain appeared slightly congested. An aspirating needle was carried downwards and forwards towards the orbital opening to the distance of one and three-quarter inches, at which depth a dark brown fluid appeared in the syringe followed by healthy pus, and this was succeeded again by a dark brown fluid. It was estimated that five drachms of purulent matter were removed. With one finger in the orbital opening, a probe was passed from above downwards to meet it, and a drainage tube was carried through the trephine hole down through the orbit, passing through the substance of the brain. A four per cent. solution of boracic acid was syringed through the tube three times a day, and its position changed.

6th. Temperature $100\frac{1}{2}^{\circ}$ F. to 101° F.; pulse 90 to 78.

7th. Second day after the trephining. A probe was passed through the brain substance about an inch and a half, downward and forward, and gave exit to half an ounce of yellow pus which welled up. Poultices were continued to the side of the head. Five grains of the sulphate of quinine with half an ounce of whiskey were given every two hours until four doses were taken. Temperature 100° F.; pulse 98 to 103. The patient suffers great pain in his right arm and shoulder. Paresis of the left forearm and hand remains unchanged. The paralysis of the tongue and face seems to have been partially relieved.

8th. The wound was probed from above through the trephine hole, and about one drachm of pus removed. The quinine and whiskey were continued, viz., 20 grains of quinine and about two ounces of whiskey daily. The patient complains of difficulty of breathing upon the right side, and passed a very restless night. Wishes to be turned over frequently. There is little discharge from the wound, and the drainage-tube appears to be choked. It was removed and a larger one substituted. Temperature $101\frac{1}{2}^{\circ}$ F.; pulse 100.

9th. The patient passed a comfortable night, and at six o'clock in the morning asked for beefsteak and a cup of coffee, which were given to him. At 12 M. the temperature was 104° F.; pulse 101. When the wound

was dressed the probe was introduced and considerable pus was liberated. He still complains of difficulty of breathing in the right side of the chest and pain in the right arm. Linseed poultices with mustard were applied to the back and chest. Careful examination does not discover any lesion of the lungs. A dose of salts was given. Ordered quinine in 10-grain doses. At midnight the pulse was 104, and temperature $101\frac{4}{5}^{\circ}$.

10th. Temperature ranges from $100\frac{3}{5}^{\circ}$ F. to 103° F.; pulse from 101 to 90. The trephine hole is occupied by a mass of granulations and blood which was torn off, and some drops of dark-coloured pus escaped. All the dyspnoea and pain in the shoulder have disappeared, and examination of the chest reveals no lesion of either lungs or pleura.

11th. Temperature $101\frac{1}{5}^{\circ}$ F. to 100° F.; pulse 90 to 98, reaching the highest point about noon.

12th. The patient examined in consultation by Dr. Janeway. The temperature $100\frac{1}{5}^{\circ}$ F.; pulse 98. There is partial anæsthesia of the left hand, especially of the index finger. The sensation of the left leg is about the same as of the right. The grip of the left hand is about 25 per cent. less than that of the right. By striking over the tendons of the wrist and leg no increased reflex is noticed. Ordered 10 grains of quinine every six hours, with half an ounce of whiskey every two or three hours during the day.

13th. Pulse quick, feeble, and irregular. Considerable pus discharges from the wounds, and syringing into the orbital cavity causes the fluid to pass up through the trephine hole, indicating that free communication exists between the two openings, and the patient has been lying most of the time upon his left side and with the head thrown back. This position has made the exit of pus from the trephine hole easier than from the opening in the roof of the orbit. Temperature $100\frac{1}{5}^{\circ}$ F.; pulse 94 to 120.

14th. Temperature $100\frac{1}{5}^{\circ}$ F. to $99\frac{1}{5}^{\circ}$ F.; pulse from 114 to 92. He continues to take 40 grains of quinine daily. Very early in the case the optic nerve of the left eye was examined and found to be œdematous, presenting the appearance of papillitis or choked disk; to-day it was again examined, and the condition found to be more pronounced, and hyperæmia more marked. The patient is perfectly intelligent, is in entire possession of his intellectual faculties, does not suffer great discomfort, and behaves well. The granulating surface in the trephine hole bleeds freely when touched.

15th. Temperature $99\frac{4}{5}^{\circ}$ F.; pulse 92 to 112, reaching its highest point about noon.

16th. Temperature 99° F.; pulse 85. The patient has some frontal headache upon the right side. The quinine was reduced to 20 grains daily. He eats well. His diet for the preceding two weeks has been largely of ice-cream, of which he has taken from two to three quarts daily. Hearing and vision good. Paresis about the same.

17th. Temperature 99° F.; pulse 78 to 85, and slightly intermittent. Pus escapes from the orbital opening; water passes through both openings when the cavity is syringed. The left arm has become smaller and softer than the right. The patient complains of headache over the right frontal region, extending to the occiput. Ice bag applied.

18th. Temperature 99° F.; pulse 85 to 98. Ice-bag to the head continued.

19th. Temperature 99° F.; pulse 75 to 90. It was found upon ex-

aming the orbital opening that pus was retained in its vicinity, and by using a long probe bent to a sharp curve, it was discharged.

The paralysis of the left side of the face and tongue has for several days been very marked; but at no time has it affected the orbicularis muscle. The patient takes 20 grains of quinine daily.

20th. Shortly after taking a dose of whiskey the patient vomited. It was found that pus existed in the vicinity of the trephine hole, in the region posterior to it. After its removal the patient was more comfortable, and his pulse stronger and more regular. He now begins to be indifferent to the state of his bladder, and is apt to wet the bed. Temperature 99°F .; pulse 90 to 76, and irregular.

Since the granulations at the trephine hole have become redundant and inclined to bleed, they have been cut down with Jarvis's snare, armed with piano wire No. 7, and the subjacent brain tissue has been removed in the same way, thereby affording easier escape for the pus.

21st. Temperature 99°F . to $99\frac{1}{2}^{\circ}\text{F}$.; pulse 78 to 88. About one drachm of very offensive pus discharges from the openings at each dressing. The granulations are removed twice a day. Quinine and whiskey are continued. Syringing through the brain substance is no longer performed, and the probe is not used for evacuating the pus.

From March 22d to March 25th the temperature ranged from $99\frac{2}{5}^{\circ}\text{F}$. to 100°F .; and the pulse from 88 to 103. On the night of the 25th the patient vomited.

26th. The patient was restless during the early part of the night. He received three enemata during the day, but without effect upon the bowels.

Fearing that pus remained concealed and was unable to escape, I passed my finger through the orbital opening and found a pocket of pus. The finger went backwards to the distance of three inches, and found the brain substance badly broken down.

Dr. Janeway saw the patient again, but found no evidence of pyæmia or meningeal complication. The temperature of the brain taken by introducing the thermometer through the trephine hole was 101°F ., in the axilla $100\frac{1}{2}^{\circ}\text{F}$. Pulse intermittent at times; 96 to 110.

27th. The patient had a restless night, and vomited three times within an hour. At the morning dressing, the wound of the orbit was full of disorganized tissue, which had to be removed by the snare, and a large slough soon followed, together with considerable pus. At the afternoon dressing I removed an additional quantity of sloughy material, and brought away a large necrotic mass, similar to that removed in the morning. The two together appeared to constitute the cyst which had inclosed the extremity of the foreign body in the brain. The slough was gray and fibrous upon one side, presenting a distinctly membranous character, and upon the other side was covered with broken-down white brain substance, with numerous points of capillary hemorrhage. The soft parts around the orbital opening have contracted together so as to interfere with the escape of fluid and with the dressing, and, therefore, the opening was enlarged by an incision upon its temporal extremity. The bowels have been constipated for some days, and no relief has been afforded by enemata. Ordered one drop of croton oil. Pulse very intermittent.

28th. Has had a bad night, and has nausea and vomiting. Free hemorrhage has taken place from the orbit, the cavity is occupied by a clot and granulations which protrude about one inch. When this was removed hemorrhage continued to occur, and was with difficulty arrested.

The patient is evidently much worse. Temperature $103\frac{1}{5}^{\circ}$ F.; pulse 108. The temperature continued to rise, and at 10 A. M. was $104\frac{4}{5}^{\circ}$, and the pulse jumped to 160. During the day the patient gradually sank, and died at about 1 o'clock on the morning of March 29th, which was the thirty-ninth day after the removal of the foreign body.

He continued perfectly intelligent up to within *two* hours of his death, although indisposed to talk.

Hypodermic injections of whiskey were giving during the day, and beef-tea per rectum. There were no convulsions, nor additional paralysis, nor delirium. The patient could always be aroused, and did not suffer severe pain.

From the 6th of March to his death he was vigilantly cared for by Mrs. Dr. Pratt, of Salt Lake City, who performed much of the dressing and aided the House Surgeon, Dr. Charles Orr. He also had the constant services of two nurses.

The *autopsy* was made twelve hours after death, by Dr. W. H. Welch, assisted by Drs. J. L. Minor and Charles Orr. The following is Dr. Welch's report.

Autopsy.—By request only the head was examined.

External Appearances. The upper part of the nose is sunken in in consequence of depression and partial loss of the nasal bones. Immediately below the right eyebrow there is a gaping hole, 3 ctm. in transverse, 2 ctm. in vertical diameter. This hole extends horizontally along the upper margin of the upper eyelid, which is thereby somewhat depressed. This hole extends through the integument, subjacent tissues, and orbital plate of the frontal bone into the cranial cavity; the right eyeball is absent; there is a round hole $\frac{3}{4}$ ctm. in diameter, a little to the right of the median line of the nose, and on a level with the lower margin of the orbit. A probe can be passed through this hole into the nasal cavity; from this hole can be traced a line of cicatrix upwards to the gaping wound first described, and obliquely downwards for a distance of 3 ctm. to the left side of the nose. Another cicatricial line extends from the small hole for $3\frac{1}{4}$ ctm. along the right side of the nose to the nostril.

Near the roots of the hair on the right side there is an opening $2\frac{1}{4}$ ctm. in diameter through the integuments and frontal bone into the cranial cavity. This opening is situated 5 ctm. from the median line and 7 ctm. from the orbital margin of the frontal bone; around the margin of this opening, posteriorly and inferiorly, the bone is laid bare for a distance of 2 ctm. A Λ -shaped cicatrix 5 ctm. long extends from the opening downwards towards the ear.

Brain and Membranes. Upon removal of the calvaria, openings are found in the dura mater which correspond in situation to those existing in the cranial bones. One is situated opposite the opening in the vertical plate of the frontal bone, the other corresponds to the opening in the horizontal plate of the same bone; around the margins of these openings, as well as elsewhere, the external surface of the dura mater appears normal. The dura mater presents no abnormal separation from what remains of the bones forming the floor of the right anterior fossa of the skull, being as usual here quite adherent. The superior longitudinal sinus contains a loose, decolorized post-mortem clot. The other sinuses contain reddish clots and fluid blood, but no thrombi.

Upon cutting through the dura mater on a line with the sawn surface of the cranium, this membrane is found to be without abnormal adhesion,

save around openings into the brain, which correspond in situation to the openings previously described in the dura mater and the bone; around these openings, which exist one on the convexity and the other on the orbital surface of the right frontal lobe, the dura mater is firmly adherent for a distance of $\frac{1}{2}$ to $1\frac{1}{2}$ ctm. to the subjacent pia-arachnoid membrane. These adhesions are such that fluids injected into the cavity formed in the frontal lobe (as described below), or escaping from this cavity, would not make their way into the surrounding sub-dural space. For a distance of 3 or 4 ctm. around these openings the inner surface of the dura mater presents the appearances of a hemorrhagic pachymeningitis. It is here coated with a thin yellowish-brown delicate membrane, which can be stripped up with the forceps, and which in places is adherent to the pia-arachnoid membrane. A short distance in front of the opening on the convexity of the frontal lobe a small, loose red coagulum of blood rests on the pia mater. Elsewhere the inner surface of the dura mater appears normal.

For a distance of about 2 ctm. around the openings into the frontal lobe the pia mater is of a yellowish color, and contains a few small ecchymoses. Elsewhere over the convexity of the hemispheres the pia mater presents a normal appearance. The pia mater covering the base of the brain, however, is acutely inflamed. Here there is a sero-purulent, yellowish-green exudation into the meshes of the pia mater, most abundant over the medulla oblongata, pons, inter-peduncular space, and inner parts of the fissures of Sylvius. This exudation is as much on one side of the brain as on the other, and does not extend to the convexity, where there is rather less than the normal quantity of fluid in the pial meshes.

The convolutions of the left cerebral hemisphere appear somewhat flattened as if there were increased intra-cerebral pressure. The lateral ventricles on both sides contain an increased amount of fluid rendered turbid by admixture of fibrin and pus, which also infiltrate the choroid plexuses. In each ventricle the fluid amounts to about 50 cubic ctm.

The right frontal lobe is somewhat sunken in. On the convex lateral surface of this lobe is a nearly circular hole about 5 ctm. in diameter, which opens into a cavity occupying the interior of this lobe. This hole involves the second and third frontal convolutions, which are thereby destroyed to a corresponding extent. The upper margin of this opening is 3 ctm. distant from the superior longitudinal fissure, its anterior margin is $3\frac{1}{2}$ ctm. distant from the anterior margin of the frontal lobe, its posterior margin is $1\frac{1}{2}$ ctm. from the anterior central convolution; the edges of this opening are thin and of a greenish colour, with here and there a few ecchymoses.

The orbital surface of the right frontal lobe is almost wholly destroyed. The gyrus rectus with the olfactory tract and bulb are, however, preserved. This opening into the orbital surface measures about 5 ctm. in diameter, both antero-posteriorly and transversely; the edges of this opening are likewise thin, discoloured, and beset with small hemorrhages. The distance between the lateral margin of the opening in the orbital surface and the inferior margin of that in the convexity of the frontal lobe measures 4 ctm. over the surface of the brain.

The interior of the right frontal lobe is destroyed and occupied by a cavity with soft, greenish, sloughy walls composed of the surrounding brain substance; the walls of this cavity measure from 2 to 8 or 10 mm. in thickness; the innermost part corresponds to the convexity and to the

orbital surface of the frontal lobe. This cavity extends backward so as to have undermined somewhat the anterior central convolution. The cavity communicates with the anterior part of the right lateral ventricle. The anterior part of the nucleus caudatus and the adjacent portion of the internal capsule upon this side are destroyed. The white matter of the parietal and temporo-sphenoidal lobes adjacent to the cavity is soft and white in colour. The change here resembles the so-called hydrocephalic softening observed around the ventricles in many cases of tuberculous meningitis, and usually attributed to post-mortem changes. The substance of the left cerebral hemisphere is moist.

After removal of the brain and membranes the opening in the orbital plate of the frontal bone is found to measure $3\frac{1}{2}$ ctm. in antero-posterior, and 3 ctm. in transverse diameter. This opening extends backwards so as to involve the lesser wing of the sphenoid cavity.

The left optic nerve and the posterior segment of the left eye were removed and examined. The dural sheath of the optic nerve is markedly distended by an accumulation of clear serous fluid in the sub-dural space; the optic papilla is decidedly swollen, and presents ill defined contours and a hazy appearance. The central vein and its branches are large and distinct.

The brain, after removal, was placed in Wickersheimer's fluid, where it remained for ten days. It was then transferred to alcohol, in which it acquired a firm consistence, and still preserved nearly its normal colour; after hardening, two frontal sections were made through the hemispheres, one through the anterior central, and the other just behind the posterior central convolutions. The cortex and the immediately subjacent white matter of these convolutions appeared normal. The deeper white matter, however, namely, the foot of the corona radiata, where this latter passes into the anterior part of the internal capsule, is softened upon the right side, and contains several small hemorrhages. The anterior third of the right internal capsule, and a part of the nucleus caudatus is destroyed as already described. The motor tract affected, therefore, includes the anterior part of the internal capsule and the adjacent coronal expansion of its fibres into the centrum ovale. The anterior of the left hemisphere presents no lesions. Upon the hardened brain the sinking in and shrinkage of the right frontal lobe is more marked than it was at the autopsy.

Remarks.—In reviewing the case certain questions arise. *First*, whether the foreign body ought to have been removed? In general and in the abstract this question would require a careful adjustment of many circumstances—and a large material for study. The table of cases compiled by Dr. Wharton, in the *Philadelphia Medical Times*, July 19, 1879, is valuable as a list of references, but unfortunately offers few details. To this may be added the citations under the head of brain, foreign bodies in, and brain, wounds or injuries of, contained in the *Index to the Catalogue of the Library of the Surgeon General's Office*, vol. ii. p. 351 and p. 396. See *Deutsche Chirurgie*, Billroth and Lencke, Lieferung, 30; *Kopfverletzungen*, by Bergman, p. 76 *et seq.* See also the first vol. of *Surgical History of the War of the Rebellion*, from which an analysis of recoveries after lodgment of foreign bodies in the brain, has been made by Dr. John A. Lidell, in the *American Journal of the Medical Sciences*, April,

1881, p. 335, and article on Compression of the Brain, by Dr. S. W. Gross, *Am. Journal Med. Sciences*, July, 1873, p. 40.

With this material certain discriminations must be made as to the location, fixity, duration of residence of a foreign body, and whether it is exciting any irritative symptoms. The last circumstance is of great moment. In the above case no symptoms were present, and this may be attributed to the vigorous health and quiet temperament of the subject, to the absolute immobility of the piece of iron, and to the fact that the lesion was in the frontal lobe, which we know to be more tolerant of injuries than any part of the brain. It may be argued, and with reason, that with the missile undisturbed the patient might have lived for months or years longer. This case will deserve to be quoted in favour of expectant treatment. But it will be offset by a very large number of a contrary kind—when the field of research is fully explored. I think that in this argument the several points to which I have referred will all claim careful consideration. Such a discussion presupposes that the penetration of the brain by the foreign body should be known without any explorative operation. In the case of Avery, the invasion of the brain was not only unknown, but could not have been known without performing the explorative operation. This deep wound would doubtless have occasioned intra-cranial inflammation, and I do not feel any doubt as to the necessity of removal of the foreign body under these circumstances. In corroboration of this view it may be said that the orbital plate was found to have been fractured into the sphenoidal fissure and through that opening a very direct communication was opened to the brain from the explorative wound. The above remarks apply only to cases in which a foreign body has been lodged for a considerable period of time. There would seem to be no doubt of the necessity of extracting foreign bodies which are easily accessible, when they have only recently penetrated the skull.

Second. The fact that the wound was in the orbit causes special peculiarities. In Wharton's list of cases he says that in 18 the missile passed into the brain through the orbit, and that all but one of them were fatal. Berlin, in Graefe and Saemisch, *Handbuch der Ophthalmologie*, Bd. vi. th. iv. s. 599, says that of 52 cases of fracture of the roof of the orbit by penetration of foreign bodies, 41 died, *i. e.*, 80 per cent. He adduces, *l. c.*, page 638, four cases in which foreign bodies had remained for periods varying from forty days (*Demours*, 1818) to seventeen years (*Pagenstecher*, 1864), and had been extracted; both the above died, and the two others (reported by *Percy* and *Günther*) recovered. It is probable that research would discover more cases of this kind of injury, and afford us more data for deductions. Two circumstances seem to have importance in the great mortality of these cases. First, the soft tissues of the orbit choke the aperture in the cranium and prevent easy escape of discharges; second, the recumbent posture is unfavourable for drainage through this

locality, because the injury is at the base of the brain. These two disadvantages were strongly appreciated during the treatment of Avery's case after the cerebral abscess had been opened. It was found that the posture which he constantly assumed, namely, on the left or paralyzed side, only imperfectly assisted the outflow of fluid; and, in fact, the trephine hole seemed a more ready outlet than that in the orbital roof. The great obstacle in the orbit was the continuous growth of new tissue, which encroached upon the external and on the bony openings. It would have been better if all the contents of the orbit, in addition to the eyeball, had been removed, the skin of the lids being left. A clean cavity would have made the dressing much easier. In view of the extreme danger which belongs to cases of wounds through the roof of the orbit, I think the suggestion deserves consideration whether a patient's chances might not be improved by excising all the contents of the orbit (*exenteratio orbitæ*), as soon as any tokens of cerebral or meningeal trouble appear. I know that the early symptoms are of uncertain value, and the proceeding might seem uncalled for if not dangerous. But in Avery's case it would have been better to have taken this step on the sixth day after the foreign body was removed. Better drainage would have been secured than by any of the devices which were assiduously employed for this object. Another obstacle, as it proved in Avery's case, was the cyst which had formed like a thimble around the end of the iron in the brain. This did not come away until the thirty-eighth day after removal. Inflammation began outside of it in the brain substance very early. The fluid products of inflammation were pent up outside of it, and could not sufficiently escape through the orbital hole. The only relief would have been a free incision into the dura mater and enlargement of the aperture in the roof by a small pliers or a rongeur. Another proposition intended to meet this difficulty has been made by Berlin (see Graefe and Saemisch), and was also suggested in consultation by Dr. Weir, namely, to chisel away the edge of the orbit for a breadth and depth sufficient to give ample access to the brain. This proposal arose on the sixteenth day, when the existence of a cerebral abscess was not doubted. It would have opened a direct approach to the abscess, and given an outlet not liable to be choked by growth of new tissue. Bergman, quoting Berlin, in *Deutsche Chirurgie*, Billroth and Luecke, page 249, says that the abscess in 18 fatal cases was superficial and close to the place where the bone had been fractured. Of the 18 cases, 15 had abscess of the brain, and only two had meningitis. The near vicinity of the abscess is a point to be remembered. In Avery's case the very free opening of the orbit on the sixteenth day in addition to the trephining, afforded what seemed an abundant means of escape for pus. This was furthermore promoted by using a drainage tube passed through the two openings. But the pulpy nature of the softened brain tissue clogged the holes of the tube, and they were left in position only

three days. It is not pretended that the most perfect provision for out-flow of fluid will prevent an abscess from extending farther into the brain, and thus becoming fatal. But we certainly have to strive to remove all obstacles which tend to favour its extension. In the famous Harlow-Bigelow tamping-iron case, Dr. Harlow, in a private letter to me, says that it was due in great measure to the free outlets through the skull below and above that the man Gage owed his life.

Third. The final cause of death with my patient was inflammation along the base of the brain. It is probable that the pain on the right side of the chest, which appeared on the eighteenth day, was due to irritation of the pneumogastric. The abscess did not greatly derange his functions, except by the paralysis of the opposite side. His intellect was good, digestion and assimilation good. Certainly the quinine and stimulants had no injurious effects, but quite the contrary. On many occasions it was noted that the removal of pus would be followed speedily by reduction of temperature and by greater steadiness of the pulse. The close adhesion of the dura mater around the orbital opening and the trephine hole completely shut off the arachnoid cavity from the track of the suppuration, and no meningitis spread from these situations, neither could fluids used in syringing get beyond the parts intended to be irrigated. Trial was made of two per cent. solution of carbolic acid, but this excited so much headache that it was abandoned for a four p. c. solution of boracic acid.

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NEW YORK, 233 Madison Avenue.

ARTICLE III.

NOTES OF A CASE OF LODGMENT OF A FRAGMENT OF IRON IN THE SUBSTANCE OF THE BRAIN; DEATH IN FOUR MONTHS; AUTOPSY. By GEO. BURR, M.D., of Binghamton, N. Y.

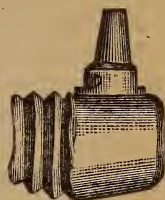
ON the 8th day of October, 1881, Leonard S. S——, a young man of about 20 years of age, residing at North Fenton, in company with another young man of about the same age, went out into the fields and woods for the purpose of shooting squirrels. They were armed with shot

guns, one of which was old, and had been made over so that caps could be used in firing it, by screwing into the side of the breech a tube communicating with the bore of the barrel. Into this tube, and standing at a right angle to it, was also screwed a smaller tube, called the nipple, on which the cap was placed. On firing this gun by S——'s companion, he standing near by, the breech of the gun burst, and both young men fell to the ground. They soon recovered, and S—— rose to his feet with a copious discharge of blood from a wound he had received, immediately above and near the centre of the zygomatic arch upon the left side. He was conveyed to his home, and a surgeon, Dr. C. W. Greene, of Chenango Forks, was called, who on examining the wound was satisfied that it was of a serious nature, and requested that I might be sent for. The next day, October 9th, I saw the case. The patient was lying in bed, perfectly conscious, complaining only of soreness in the vicinity of the injury, and some slight headache. None of the cerebral functions nor of the cranial nerves were involved or disturbed, with the exception of a slight defect in hearing in the left ear. His mind was unaffected, his recollection of the occurrence clear, his sight perfectly normal, nor was there paralysis of any of the nerves.

The statements made to us rendered it very probable that the tube or cylinder and nipple had caused the wound; but we could hardly believe that a very serious injury had been suffered, but that the missile, whatever it might be, must be outside of the cranium. Some efforts, therefore, were made to extract it by forceps, but these attempts failing, the patient was put under the influence of an anæsthetic, and the forefinger was passed into the wound. In doing this portions of brain matter escaped. On pushing the finger still further inward, a large opening was found in the cranial wall, through which the finger readily passed into the cavity of the cranium. No trace of the missile could be reached by the finger, nor found by any other means. The question of further surgical interference then presented itself, and we finally determined to make no further attempts to extract the piece of iron at that time. The patient soon began to rally, and within a week left his bed, and a few days afterwards was out of doors.

On Monday, the 23d of January, 1882, S—— called at my office, having driven a distance of at least twelve miles. He appeared well and hearty, had, however, a fistulous opening where the projectile entered, through which was discharging purulent matter. He said he was going to work again, and I afterwards learned did go to work cutting railroad ties. On the 21st of February he was taken with violent pain in the head, and in three or four hours died, having carried the mass of iron in the brain four months and thirteen days. The day before he had had a debauch, and was taken home in a wagon lying flat upon his back, stupefied from the effects of drink.

The brain was removed entire by Dr. Houghton, of Greene, and placed in alcohol reserving it for my inspection. The iron was found within the brain, and proved to be as at first supposed the tube and nipple of the gun. An accurate drawing of it of its actual size was made, and is reproduced with these notes. It was found in the anterior and inferior angle of the left middle lobe of the cerebrum in near proximity to the fissure of Sylvius. The cavity in which it was imbedded was lined by a distinct membranous cyst.



ARTICLE IV.

A CLINICAL STUDY OF THE DISEASE AND CURABILITY OF INEBRIETY. By
T. D. CROTHERS, M.D., Supt. of Walnut Lodge, Hartford, Conn.

IN 1878 there was admitted in the Asylum at Walnut Lodge, Hartford, Conn., forty-two patients suffering from inebriety and the use of opium. Of this number, thirty-five left the asylum with consent, the same year of their admission. On the asylum books they were noted as follows:—

Discharged recovered	10
Discharged greatly benefited	20
Discharged without results	4
Died	1
	<hr/>
	35

It is proposed to study the history of these cases, and the results of treatment after a period of nearly four and a half years from the time of leaving the asylum. The history of each patient was recorded at the time of admission, based on his statements and those of his friends and relatives. The constant tendency to exaggerate and cover up the real facts by the patients, and sometimes their friends, required great care and frequent reconsideration of the clinical history, to exclude all sources of error. In many instances the facts were only obtained from long correspondence, close observation, and acquaintance with the patient. Each case was studied from a physical point, and all the mental phases recorded and analyzed as far as possible.

The first question was the evidence of an inebriate diathesis, or a special inherited predisposition to use spirits coming from the parents direct.

The number exhibiting this diathesis was eight, as follows: In two instances the father drank spirits to excess for years before and after the birth of the patient. In one case the father was intoxicated at the time of conception. In two cases the mother used wine and spirits before and

during pregnancy, and in two cases both parents used spirits to excess at times. In one case the history was obscure, but the indications were that both parents used spirits at different times, being free livers, and frequenting drinking society. In three cases the particular inheritance seemed beyond all doubt. In the next twelve cases the heredity was more removed, and less distinct, but still a prominent factor. In three cases the grandfather on the mother's side drank to excess; in four cases the grandparents were drinking people; in one case both grandparents, as far as the history could be obtained, were inebriates, and died from excess. In four cases insanity, inebriety, and consumption had been prominent in the grandparents. In eleven cases a defective brain and nerve inheritance was prominent, as follows: In seven instances, different states of monomania, paralysis, hysteria, and forms of persistent neuralgias, were present in one or both parents. In three instances insanity was present in the parents, with epilepsy in the father in one case. Thus in thirty-one out of the thirty-five cases there were positive inherited nerve and brain defects, which formed the active soil for the propagation and growth of inebriety. In the first eight cases, the probability of inebriety appearing in the next generation was almost a certainty, in view of the clinical history of the parents, and a knowledge of heredity. In the twenty-three cases which followed, the predisposition to disease was very marked, the form in which it appeared depending on some unknown factor. In the remaining cases, four in number, no history that was reliable could be ascertained of defective inheritance.

The second question was the general exciting or predisposing causes, apparent in these thirty-one cases.

In the eight cases where the inebriate inheritance was direct from the parents, inebriety began in three cases at puberty, following the evolution of the sexual function. In one case a positive pleasure in the taste and effect of spirits began at the age of seven years. Two cases appeared in which inebriety followed great grief and disappointment, in another instance domestic trouble was the exciting cause. The last case, the inebriety began from the excitement of success in being elected to an office of much honour. A brief outline of each of the twenty-three remaining cases will more clearly bring out the chain of causes, and make them better understood.

CASE 1.—A merchant; grandfather on mother's side an inebriate; had dyspepsia from bad living and over-work; began to drink after using alcohol as a medicine.

CASE 2.—A carpenter; grandfather and two uncles on mother's side died from excessive use of spirits; was temperate up to the time of entering the army; then began to drink to excess.

CASE 3 was a farmer; whose grandfather on the mother's side drank at intervals to great excess; he drank first after a period of severe exposure and hardship in the Maine woods.

CASES 4 AND 5.—Both merchants; the grandfather on the mother's side drank in one case, in the other the grandmother on the mother's side used opium and spirits. In both cases inebriety came on from business troubles and mental strain.

CASE 6 was a workman, whose grandparents on both sides were drinking people. He first used spirits after being employed in a distillery. From his own statement it was curiosity at first, then after he became intoxicated the first time he continued to use spirits.

CASE 7.—A liveryman; both grandparents drank; he suffered from what was called fits, in childhood, and used spirits at puberty after sexual excess.

CASE 8.—A builder and carpenter; inebriety in several uncles and aunts, moderate drinking in the grandparents; when ten he drank to intoxication, and had always a passionate love for the taste of spirits.

CASES 9 AND 10 were clerks and bookkeepers, with a strong insane tendency, which had appeared in nearly every branch of the family for generations back. The exciting cause was mental strain, overwork, and general neglect of healthy living.

CASE 11 was an editor; consumption and cancer had appeared in every branch of the family extending back to the great-grandparents. After a severe attack of pneumonia inebriety appeared; two years after the use of opium began, and alternated with alcohol for many years.

CASE 12 was a physician, with a marked history of insanity on the mother's side. Suffered from dyspepsia and extreme hypochondria, followed by inebriety, with acute mania after protracted drinking.

CASE 13 was very wealthy with no business; hysteria and epilepsy very prominent in all the generations back. Began to use spirits after an extended trip to Europe.

CASES 14, 15, and 16 were traders and merchants, whose ancestors were eccentric, strange people; with a history of dyspepsia, hypochondria, and hysteria. In the first case inebriety began after the death of his wife, in the other cases exposure in the army was the active cause.

CASE 17 was a lawyer; his father, grandfather, and two uncles had paralysis agitans when about forty years of age. After a severe business reverse he began to use alcohol to intoxication.

CASE 18 was a farmer, whose mother was a weak, passionate woman, always complaining, and using drugs for every trouble. He drank after an attack of typhoid fever.

CASE 19 was a saloon keeper; both parents low, selfish people. He drank soon after marriage, and lived a low, irregular life.

CASES 20 and 21 were persons without business; with insanity in the family, in grandparents and uncles; one dated all his drinking from the time of a shipwreck on a yacht and the rescue by a light-house keeper; the other drank soon after he began to gamble and spend his nights at faro.

CASE 22 was a clergyman; his father was a great gourmand and beer drinker. After a season of overwork and great excitement from a revival meeting he began to use spirits to excess.

CASE 23.—Of no business; father an epileptic; he began to drink after some trifling business trouble.

It is apparent from this outline of cases, that heredity was a prominent factor, traceable in nearly all the cases, and that the exciting and predis-

posing causes, were also exploding and developing influences, which determined the disease of inebriety. These exciting and predisposing causes can be traced in nearly all cases, and where it is not apparent, our knowledge and means of ascertaining it are at fault.

The third inquiry is, when inebriety begins does it follow some regular order that can be traced and anticipated in the study and treatment?

In a large proportion of cases this can be demonstrated beyond all question. In others much obscurity prevails, and a connected chain of symptoms cannot be made out from our present limited knowledge of the subject. The following cases represent the two extremes of symptomology and progress :—

In Case 13 hysteria and epilepsy prevailed in both branches of the family, and a marked entailment of nerve weakness and exhaustion existed. He grew up well and hearty until after leaving college, when he complained of exhaustion, and was very sensitive and easily excited. After marriage he visited Europe, and drank for the first time to intoxication. From this time he could not stop drinking, and during the next two years ideas of persecution appeared, and he became boastful and extravagant in his manner. Never would acknowledge that he drank to excess. Attempted to do business and failed. Became more and more excitable in his talk and actions. Tried to reform, and was sober two months after the death of his wife, then began to use spirits again. He was untruthful, and resorted to the most childish efforts to conceal his condition. He grew worse through every effort to recover, mind and body failing alike, until he was brought to the asylum. The order of the symptoms in the case ran as follows : Excitement of travel ; wine drinking to intoxication. From this time the constant use of spirits, both wine and stronger alcohols, followed. The desire increased with each indulgence, and his mind grew more and more insensible to his real condition. Delusions of strength to control himself, and persecution from his family. Egotistical extravagance of action and work. Fitful unavailing efforts to recover, and loss of pride and faith in himself and others. General failure of mind and body, could not sleep unless he used large quantities of spirits. Increased use of spirits and increased debility of body and functional activity. The brain action in all these cases follows the fitful spasm-like movement of the heart. At times displaying force and energy, then relapsing into abject weakness. The mental failure and unsteadiness were more prominent than the changes in the body.

In Case 2 another type of symptoms and progress are seen. The inheritance from the grandfather on his mother's side, who died from excess in the use of spirits, was prominent. He was temperate and healthy up to eighteen, when he entered the army. Was confined to a southern prison for six months, and began to drink spirits soon after. He continued in the army until the war was over, and for the two years following

drank to excess constantly. Then he signed the pledge, and was very temperate for four and a half years, when, from the sudden death of his child, he relapsed, and for two years drank severely. Then he reformed and lectured on temperance for over a year, and relapsed in this work. Then recovered and relapsed again, coming to the asylum. A table of the progress of this case may be stated as follows:—

Began to use spirits from debility and exhaustion in the army, and was a continuous inebriate. He stopped by mere will-power, and four years later began again, and this time as a periodical inebriate. Then another sudden halt and relapse again, in the mean time engaging as a temperance lecturer; stopping in a manner equally strange. But each time he relapsed from some distinct cause; his mind exhibiting all the marks of degeneration seen in the former case. The mystery of the long halts, of uncertain duration, was certainly governed by conditions of physical and psychical laws, now unknown. These two cases are typical of a large class that often are not understood, and seem enigmas to their friends.

I have selected four cases, not mentioned in the above, for the purpose of showing a class of traumatic causes which have a marked influence over the progress and symptomatology. They are physical and psychical in their nature, and may be more clearly seen in an outline history of each case. Case 1. A lawyer, 38 years of age; no history of heredity could be obtained. Was in good health and temperate when he suffered from sunstroke. He was prostrated for many weeks with pain and exhaustion, and recovered a year after. After an exciting appeal to a jury in an important trial, he went out and drank to stupor. From this time the desire for alcohol appeared with great intensity after every period of exhaustion. His mind would foreshadow these attacks in the extreme egotism and boastful manners foreign to him at other times. Again he would manifest untruthfulness without motive. These and other mental phases were seen before and after a paroxysm of drinking, and at first disappeared during the free interval, then continued from one attack to another. Case 2, a clergyman, 48 years old, with probably an inebriate diathesis present. The death of his only daughter by an accident caused him, in despair, to drink to stupor. From this time, for fourteen years his life was a perpetual struggle to control an intense craving for alcohol, and failure to do so. His mind showed a great change; he became an infidel and spiritualist; his habits, character, and actions deteriorated steadily; the mind and body were in constant antagonism to procure spirits and escape from the bondage of this impulse. The mental symptoms clearly showed which was uppermost. In the asylum a study of this phase determined the question of the form of treatment at all times. Case 3 was a strong, vigorous farmer of 31 years of age. He suffered from a severe lacerated wound on both legs, from a runaway, followed by great mental excitement. He remained in bed for three months after; then he began

to drink to excess at once. His habits and entire character changed, and he became an unscrupulous speculator, and when not using spirits to excess, planned and executed great swindling operations. He would drink to stupor for a day or more, then recover, and use spirits moderately for a long time. Case 4 was a travelling man for a mercantile house, 39 years old. One evening a train he was riding on, jumped the track and dashed over the rails, breaking the windows, and causing intense consternation and alarm. The excitement was so great that he was functionally paralyzed, and had to be carried from the car. Two days elapsed before he was able to continue his journey. He used spirits to excess from this time, and went gradually down from bad to worse. Unlike many other similar cases, he had no delusions of strength, but seemed to have a decreasing faith and confidence in his power to recover. These cases were clearly traceable to traumatism. The second and last was from psychical changes in the brain centres. In all, changes of structure and function followed, of which inebriety was only a sign. It may be remarked that a large number of cases of inebriety may be traced to these traumatic causes, which are now overlooked in the prominence of the later symptoms. This is a field at present almost unknown.

In a grouping of the form of inebriety, and the prominent symptoms noted on admission, the following may give some conception of the difficulties in the study of the cases and their treatment. In the first division, the periodical inebriates who used spirits to excess only at certain stated periods, with a free interval of from two days to a year or more, were twelve. In some of these cases the history of this periodicity was of exceeding interest. In two cases the interval could be calculated within an hour, and the impulse for spirits burst out, irrespective of situation and surroundings, at the exact time predicted. In the second class were grouped all those who drank steadily, with no free interval of sobriety. These were called constant inebriates, and numbered sixteen; tremors, delusions, and insomnia were present in all these cases. In the third class, called paroxysmal inebriates, of which there were six, the condition resembled an attack of acute mania, in the suddenness of its onset and short duration, depending upon some special state of the nerve centres, which, after a few hours' excess in the use of spirits, recovered their control of the organism. Case 22 was of this type. He would drink to great excess for one or two days, then stop as suddenly as he began, and the interval of sobriety would be equally uncertain. In Case 19, a bar-keeper would reform, and remain sober a long time in his business, then relapse and reform again, without any special cause or reason. One case was closely allied with opium taking, so that neither was prominent, first one then the other.

The fourth inquiry is, What is the nature and character of the treatment in these cases?

Every case is suffering from congestions, degenerations, and nutrient

perversions of every description. In the treatment the removal of all exciting causes, and building up the general strength and vigour of the organism, is the first principle. An inebriate asylum is simply a quarantine, where this object can be most easily secured. Immunity from alcohol that is almost absolute, or as near as it can be, is one of the great essentials. To accomplish this, both modified and absolute restraint over all the surroundings and habits of the patient must be exercised, depending on the special wants and needs of each one. Restraint from alcohol is only one factor, and often an insignificant one; restraint from excitement, sexual excess, overwork, and many other influences equally powerful in the causation of inebriety, are absolutely necessary. In many cases the quiet, regular living and exact surroundings are a more effectual restraint from the use of alcohol than locks and bars. Hence all restraint must be adapted to the requirements of each case, and not depend on any one thing. In a periodical inebriate and dipsomaniac, restraint at times is positively injurious, at others it is a tonic of great value. The building up process must include all the means known to science for invigorating the organism, of which electricity, baths, tonics, mineral waters, and nutrients are most prominent. With this are included exercise that is pleasant and with full consent of the patient, mental diversion and change, as well as occupation of both mind and body. The inebriate is a thoroughly sick man, needing rest and perfect freedom from all sources of exhaustion, excitement, and debility. The mind requires more skill in the treatment than in cases of the insane, and the organic degenerations are more complex, taxing every resource of science to its utmost to combat. These means must be used for long periods, of not less than from one to three years, before any permanent restoration can be expected.

The fifth and last inquiry is, What were the results from the treatment of the cases mentioned in this article?

A period of four and a half years has elapsed since these cases were under treatment, and their present condition will approximately indicate the value and permanency of the results. Letters have been addressed to both the patients and their friends, and in some instances to the family physician, and the answers may be taken as more or less reliable. In seven cases the facts came under my personal observation, and are correct. Of the first ten cases noted on the books as discharged recovered, the following table represents their condition now and during the interval from the time of treatment. The word recovery was used on the asylum books as expressing a general restoration of the physical health and return of the mind to its normal condition, manifest in healthy thought and living, with an earnest desire and exertion to get well.

Cases who are yet temperate and well	4
Relapsed once, recovered, and now well	1
Relapsed twice after a long interval, now well	2
Relapsed and now drinking	1
Relapsed and died within a year	1
Relapsed and developed general paralysis	1

Of the twenty cases noted as discharged greatly benefited, four have disappeared, and no history or trace of them can be ascertained. It is probable that most of these cases have recovered or died; in either case all history would be lost. Had they relapsed they could be more easily traced. The rule is, that cases permanently cured disappear from observation, and never refer to their past life, while the chronic incurable stands about street-corners and saloons, advertising his failure to recover and the asylum to perform a miracle in his case.

Cases that are yet temperate and well	3
Cases that were temperate up to death	2
Cases which relapsed once, and are now temperate and well	4
Cases which have relapsed more than once at long intervals, now well	3
Cases relapsed and still drinking	3
Relapsed and died from the excess	1

Of those discharged as not benefited by the asylum treatment, the following is the present state :—

Relapsed and still drinking	2
Relapsed and now in an insane asylum	1
Relapsing at long intervals	1

During treatment one died from obscure affection of the brain soon after admission into the asylum.

The following table is a summary of all the cases :—

Those still well and temperate	7
Continued temperate and well up to death	2
Relapsed once, but now temperate	5
Relapsed twice or more at long intervals, now well	5
Relapsed and still drinking	6
Relapsed and died from excess	2
Relapsed and in an insane asylum	1
Relapsed and developed general paralysis	1
Relapsed at fixed intervals	1
Died under treatment	1
No history ascertained of	4

35

The cases were under treatment from thirty-four days to six months, with an average of about four months to each one. In this time it is almost impossible to expect anything more than a beginning of permanent treatment. These results, in view of a knowledge of the difficulties of treatment, are very encouraging. Some of these obstacles may be mentioned as follows: All these cases had developed a low grade of chronicity, and exhausted every means of treatment before they came to the asylum, which is only a last resort. They come to these places credulous, and expecting results more or less miraculous, or skeptical of any good or power the treatment can give them. Hence it takes a long time to enlist the intelligent coöperation of the patient with the physician and the means applied. The treatment of inebriety had scarcely begun, and both the means and appli-

ances are sadly wanting in every institution. The full support by the public both legally and morally, with trained men to study and apply the means for treatment, are also wanting. Until such a time, when institutions are founded and conducted by experts, with every resource at command, similar to insane asylums, the difficulties of this work will be very formidable. The results of treatment to-day, with the worst cases, and the crudest means and methods of restoration only faintly indicate the possibility of cure in the future. The restoration of seven in thirty-one cases, after a period of four years and more, is an unmistakable sign of the eminent curability of inebriety, with better means, and larger knowledge.

In a general review of the facts gleaned from a study of these cases, and the results of treatment as seen at this time, I have great confidence in believing that the following propositions are correct, and will be confirmed in all future studies :—

1. Inebriety is a disease, which may be studied, traced, and understood, and whose course or march follows a progressive line, full of hints pointing out the means of cure and prevention.

2. Inebriety is curable as other diseases are, by the application of physical remedies in proper surroundings, by competent men, who seek to apply exact means to meet every case.

3. Inebriety must be studied from a physical point of view, as the result of physiological and psychical laws, and not a matter of chance, or a low vicious element in human nature.

4. Standing on the frontier lines, vast outlines of hills and valleys stretch out before us, all under the domain of law. When the traditional superstition, which hangs over this field, vanishes, and the causes of inebriety are known, as well as the means for prevention and cure, a new era of humanity and civilization will begin.

5. The increasing prevalence of inebriety in this country demands a scientific study of the subject, and a more thorough acquaintance with the laws and forces which govern its rise and progress ; from this a knowledge of the best means of treatment will be ascertained and applied.

ARTICLE V.

INDUCED SEPTICÆMIA IN THE RABBIT. By GEO. M. STERNBERG, M.D.,
Surgeon U. S. A.

THE object of the present paper is to compare the results obtained in some recently reported experiments upon rabbits (Report to the Scientific Grants Committee of the British Medical Association, by Peter Murray Braidwood, M.D., F.R.M.S., and Francis Vacher, F.R.C.S.Ed., *British*

Med. Journal, Nos. 1100 and 1101, 1882), with the writer's experiments made last year under the auspices of the National Board of Health. (A fatal form of septicæmia in the rabbit produced by the subcutaneous injection of human saliva. *National Board of Health Bulletin*, April 30, 1881.)

These two series of experiments considered together give confirmation to the view, already entertained by high authorities upon clinical and experimental evidence, that there are two forms of septicæmia; the one a septic toxæmia due to the effects of a chemical poison or poisons evolved during the putrefactive decomposition of certain organic substances—especially of nitrogenous animal products—the other an infectious disease produced by the rapid multiplication in the body of the infected animal of a parasitic organism.

Of the latter form there may be as many varieties as there are species—or physiological varieties (Pasteur)—of bacteria which find in the fluids or tissues of living animals conditions suitable for development. The best studied and most widely known form of septicæmia due to the presence of a parasitic organism is the disease known as anthrax—*charbon* of the French, *miltzbrand* of the Germans—but several other varieties are now well established, in which similar symptoms and pathological results are produced by organisms morphologically different from the *Bacillus anthracis*. Among these may be mentioned the form of septicæmia in the mouse, so well studied by Köch, which is due to a minute bacillus, and the form of septicæmia in the rabbit produced by the subcutaneous injection of human saliva, due to a micrococcus, which has been studied by Pasteur, Vulpian, and by myself (independently). It may be that in both forms of septicæmia, viz., in septic toxæmia from the absorption of certain of the products of putrefaction, and in the infectious septicæmia due to the presence of a parasitic organism, the immediate and essential cause of the disease processes and results is the same, and that the organisms are simply the remote cause as producers of the poison, this being effected in the one case external to the body by an organism which does not find conditions favourable to its development in the interior of the animal, and in the other by one which is able to thrive within and at the expense of the fluids or soft structures of the living body. There is good reason to believe that organisms of the first class which habitually feed upon dead organic material, and require the presence of free oxygen may become habituated to changed conditions and acquire the power of invading living tissues, especially when these are enfeebled as the result of septic toxæmia, profuse loss of blood, wasting discharges, etc. But this is a branch of the subject upon which I shall not enter at present.

Whatever may be the *modus operandi* of the septic poison, or of septic organisms capable of reproduction within the bodies of living animals, there can be no doubt that all varieties of septicæmia are due directly or

remotely to the action of bacteria, for it is now well proven that putrefactive processes depend upon the presence, and vital activity of these minute vegetables.

The present state of science justifies us in formulating the axiom *nō bacteria, nō putrefaction*, and as animal and vegetable tissues subject to putrefaction exert no injurious effect—except in the case of poisonous chemical products evolved in the growth of certain plants—but, on the other hand, are essential for the sustenance of living animals, it is evident that in the end bacteria are responsible for all septic disease processes.

Observation and experiment indicate that septic toxæmia may be acute or chronic, according as it is produced by a single large dose or by frequently repeated small doses of the poison or poisons evolved during the putrefactive fermentation of organic substances; that death may result in a comparatively brief time from a lethal dose of the toxic agent; or, that it may occur at a later date as the result of secondary changes in the blood and in vital organs; and that the poisoning may occur through various channels, *e. g.*, (*a*) through the lungs by continued respiration of an atmosphere contaminated with emanations from putrefying material—filth; (*b*) through the mucous membrane of the alimentary canal when putrid matter is taken with food or drink, and probably also from the putrefaction *in situ* of imperfectly digested or unduly retained material in the *primæ viæ*; and (*c*) from the surface of suppurating wounds, from putrid purulent collections in any part of the body, and from decomposing secretions or discharges from any surface or cavity.

The experiments recorded by Braidwood and Vacher, *l. c.*, were mainly made with lochial fluid undergoing putrefaction, and their results indicate that they produced in the animals experimented upon septic toxæmia of greater or less severity.

The following *résumé* of results is given by the authors themselves.

Résumé.—**SERIES A:** Infected thirteen rabbits with a solution of lochia itself, or mixed with antiseptics.

Infected four rabbits and one dog with purulent fluid diluted.

Infected four rabbits with an aqueous solution of macerated muscle.

Infected two rabbits and one dog with grumous fluid from the peritoneal cavity.

Of these in seven instances (rabbits), and in two (dogs) recovery took place.

In eleven experiments, the animal (rabbit) was inoculated by injection through the vaginal wall.

In ten experiments the animals (eight rabbits and two dogs) were inoculated subcutaneously.

In three experiments the animals were inoculated by injection through the abdominal peritoneal cavity.

In four experiments the animal (rabbit) received the septic fluid applied to an open wound.

In one experiment the animal (rabbit) was inoculated by injection into a vein.

SERIES B: Infected fourteen rabbits and one dog with lochial solution by itself, or mixed with antiseptics.

Infected seven rabbits with purulent fluid diluted, or mixed with antiseptics.

Of these in nine instances (rabbits), and in one (dog), recovery took place.

In ten experiments the animals (rabbits) were inoculated by injection through the vaginal wall.

In six experiments the animals (rabbits) were inoculated by injection *per peritonæum*.

In four experiments the animals (rabbits) were inoculated subcutaneously.

In one experiment the animal (dog) was inoculated by injection *supra pubem* into the abdominal peritoneal cavity.

SERIES C: Injected five rabbits with freshly removed peritoneal purulent fluid from a patient.

Injected two rabbits with freshly removed sanguineous peritoneal fluid from a patient.

Of these in the two last instances (rabbits) recovery took place.

In three experiments the animals (rabbits) were inoculated by injection through the vaginal wall.

In one experiment the animal (rabbit) was inoculated by injection *per peritonæum*.

In three experiments the animals (rabbits) were inoculated subcutaneously.

The conclusions drawn by the authors from their experiments are summarized as follows:—

“We may then infer from our three series, consisting of fifty-four experiments: (1) that the fact of the septic fluid having been derived from a serous cavity, as the peritoneal, is not the cause of the septicity; (2) that the purulent condition (*de novo* or by admixture) intensifies its septic power; (3) but that pus alone is not necessarily septic to animals, as has been previously repeatedly proven by various experiments; (4) that purulent fluid from a serous cavity (especially that from the abdominal peritoneal cavity) is more lethal than that derived from connective tissue; (5) that putrefaction or decomposition decidedly intensifies the septic or lethal action of a septic fluid; and that (6) the septic influence of human lochia on rabbits is due to some special property in it (*sui generis*), and is not connected with the presence in it of micrococcus organisms.”

If we contrast with these results those obtained by myself from the subcutaneous injection, in the rabbit, of human saliva, we shall find very striking differences, which may be summarized as follows: (1) greater mortality; (2) lethal dose much smaller; (3) date of death and pathological appearances quite uniform; (4) putrefaction of saliva destroys its virulence; (5) virulence is connected with the presence of micrococci; (6) serum from subcutaneous connective tissue and blood from an animal recently dead swarms with micrococci, and is virulent in the smallest quantities; (7) antiseptics promptly destroy virulence of saliva and of fluids from the body of infected animals.

I shall now proceed to discuss in detail, but as briefly as is consistent with the object in view, each of the above-enumerated points of contrast.

(1) *Greater Mortality*. The tabular statement of experiments made by Braidwood and Vacher shows that rabbits were inoculated with septic fluids, through various channels, 51 times, with a fatal result in 33 instances. In ten experiments antiseptic substances were mixed with the septic fluid used, with a fatal result in eight instances. In several cases the fatal result seems to have been due to an accidental complication. Thus, the notes of the experimenters show that in experiment No. IV., in which death occurred thirty hours after injecting one drachm of lochial fluid, *per vaginam*, into the pelvic cavity of a rabbit, the necropsy showed “a large clot in the right iliac region external to the muscles.” In experiment V., in which the injection was made into the abdominal perito-

neal cavity, death occurred in eighteen hours, and the post-mortem examination showed that the intestine had been punctured by the hypodermic needle. In experiment VIII., it is recorded that the animal received accidentally a bruise over the right hip, which gradually induced a subcutaneous abscess. In experiment XXV. the remark is made: "Death probably resulted from an accident, as shown by the necropsy." Excluding these experiments we have left 37 with a mortality of 21. How far this mortality was dependent upon the fluid injected *as a septic fluid*, and how far it was due to injury inflicted by the hypodermic needle at the time of the operation, or to the mere presence of the fluid introduced into the pelvic or peritoneal cavities, it is impossible to determine, but it is evident that there is a greater liability to accidental complications in this method than in the method by subcutaneous injection into the connective tissue, employed by myself. The contrast as to mortality, however, is very striking. I say in my original report:—

"I have demonstrated by repeated experiments that my saliva in doses of 1.25 c. c. to 1.75 c. c., injected into the subcutaneous connective tissue of a rabbit, *infallibly produces death*, usually within forty-eight hours."

The number of experiments upon which this announcement rests I am not able to give at the present moment, as my detailed report of these experiments is in the hands of the National Board of Health, and I have not a retained copy at hand.¹ I think, however, that I am quite safe in saying that I have repeated the experiment at least twenty-five times with my own saliva. But experiments made subsequently to the writing of the above quotation from my original report, make it necessary for me to slightly qualify the language of this. I can no longer say *infallibly* produces death, as in several instances death has not occurred in rabbits which had been previously injected with saliva mixed with certain substances—alcohol, quinine—which, when added to it in a certain proportion, prevent the usual fatal result, but do not prevent an impression being made by the mixed injection, which seems subsequently to protect the animal from the lethal effects of injections of saliva alone.

I have not yet performed a sufficient number of experiments to enable me to speak with confidence as regards the protective influence of these mixed injections, but hope to pursue the investigation at some future time.

(2) In the experiments of Braidwood and Vacher the amount of septic fluid injected was from half a drachm to a drachm and a half. There is good reason to believe that this amount of pus, or of "grumous lochial fluid" introduced into the pelvic or peritoneal cavity of a rabbit might give rise to secondary deposits in the liver, etc., and produce death from causes quite independent of the septicity of the fluid injected. This view

¹ This detailed report, I am informed, will be published in full in the Annual Report of the National Board of Health for the year 1881.

is sustained by the remote period at which death occurred in a number of cases, and by the post-mortem notes, which show that secondary deposits in the liver, etc., were of common occurrence in these cases.

In my experiments the maximum amount of saliva injected was less than the minimum quantity of septic fluid used by Braidwood and Vacher, and there is good reason to believe that still smaller quantities would have been quite as effective, as *the smallest dose produced death quite as promptly as the largest*. In one experiment with small rabbits three out of five succumbed to an injection of one minim of saliva diluted with five minims of distilled water (each).

I beg those who undertake to repeat my experiments to observe that *my* saliva in the quantities mentioned produced the results recorded. The question as to whether the saliva of other individuals injected in the same manner would produce similar results is answered as follows:—

“The saliva of four students, residents of Baltimore, gave negative results; eleven rabbits injected with the saliva of six individuals in Philadelphia gave eight deaths and three negative results; but in the fatal cases a less degree of virulence was shown in six cases by a more prolonged period between the date of injection and the date of death.”

Vulpian has since reported to the French Academy results corresponding with my own, so that it is evident that I do not alone enjoy the distinction of cultivating in the secretions of my mouth a micrococcus fatal to rabbits when introduced beneath their skin.

(3) In the experiments of Braidwood and Vacher death occurred at a later date than seven days in no less than 13 out of 21 fatal cases under consideration, and the pathological appearances noted are not at all uniform in character. In my experiments the rabbits were so commonly found dead or dying on the second morning after inoculation that I have come to look upon thirty-six to forty-eight hours as the duration of the fatal infectious disease produced thereby. The constant and characteristic pathological lesion found by me was a diffuse cellulitis, or inflammatory œdema, extending in all directions from the point of injection, attended with an abundant exudation of bloody serum swarming with micrococci.

Hemorrhagic extravasations in the subcutaneous connective tissue and in various organs were of frequent occurrence, and changes in the liver and spleen, such as are common to quickly fatal septic diseases, were commonly found. The spleen was usually greatly enlarged, and sometimes contained black pigment; the liver was frequently dark in colour, and gorged with blood, but more often of a leather colour, and containing much fat, resembling, in these particulars, the liver of yellow fever.

(4) Braidwood and Vacher find “that putrefaction or decomposition decidedly intensifies the septic or lethal action of a septic fluid.” In my experiments putrefaction was found to destroy the virulence of the saliva. When this fluid was kept in a *culture* oven for twenty-four hours, at a

temperature of 37° cent., it developed an odour of putrefaction, and *no longer* produced any noticeable results when injected beneath the skin of a rabbit.¹

(5) In my experiments, micrococci in great abundance were constantly found in the bloody serum from the œdematous connective tissue, and usually in the blood of rabbits just dead. By filtration and culture experiments proof was furnished that the virulence of these fluids depended upon the presence of the micrococci. Braidwood and Vacher find that "the septic influence of human lochia on rabbits is due to some special property in it (*sui generis*), and is not connected with the presence in it of micrococcus organisms." The latter clause of this proposition may be accepted upon the evidence furnished by the experimenters. But it may be questioned whether the septic influence of human lochia "is due to some special property in it *sui generis*." In the tabular statement of their experiments the authors make such remarks as the following, in referring to the lochial fluid injected into rabbits: "Had a slightly fetid odour;" "fluid very fetid, sanious and grumous;" "filled the sloughing wound with two pellets of cotton-wool which had been soaked, 70 hours previously, in fetid lochia from Mrs. G.," etc.

(6) Although the experimenters failed in certain cases to note the presence of the bacteria of putrefaction in the lochial fluid injected into their rabbits, as, for example, in the instance in which this is described as "very fetid, sanious, and grumous," there can be very little doubt that putrefactive changes had taken place, and there seems to be no good reason for assuming the presence of some "special property" differing from that found in other putrefying material of animal origin. According to my observations, the vaginal mucus of healthy females contains an abundance of bacterial organisms, and it is quite probable that, under the favouring influence of an elevated temperature, the lochia is usually more or less advanced in putrefaction before it reaches the vaginal orifice, especially when the flow is scanty, and a well-closed os tends to the retention of the fluid within the uterus. The lochial fluid as it escapes from the uterine vessels is probably bland and harmless, not differing materially from blood-serum, and holding in suspension a certain number of the corpuscular elements of the blood. In the serum present in the œdematous connective tissue of a rabbit killed by the injection of saliva, we have a fluid similar in its origin—from the blood—and in its physical characters so far as the naked eye can discern. But the microscope reveals in it the presence of innumerable micrococci, and experiment shows that a minute quantity introduced beneath the skin of a healthy rabbit will produce speedy death. I have in a number of instances, and as often as the experiment was tried,

¹ My saliva is odourless, and has the normal reaction. I am not aware that it presents any peculiarity unless it be that it is secreted in unusual abundance. My teeth are sound, and I do not use tobacco.

produced fatal septicæmia in a rabbit by introducing beneath its skin a hypodermic needle dipped in the blood of a rabbit just dead as the result of an injection of saliva.

(7) Finally, in the experiments of Braidwood and Vacher, in which antiseptics were mixed with the septic fluids injected into rabbits, the mortality was increased by this admixture, showing that these so-called antiseptics—carbolic acid, sulphurous acid, potassium permanganate—did not neutralize the poisonous septic element in the fluids used.

On the other hand, a series of experiments made by myself to test the comparative value of disinfectants¹ has demonstrated conclusively the power of these and many other substances generally recognized as antiseptics, to destroy the virulence of blood and serum from a septicæmic rabbit killed by an injection of human saliva. The proportion required differed with different substances and was considerably greater for carbolic acid and potassium permanganate than for iodine, ferric sulphate, and the mineral acids, being less than 0.5 per cent. for the latter, while 1.25 per cent. of carbolic acid, and 2 per cent. of potassium permanganate was required to disinfect the virulent fluid used in my experiments. The proportion of these disinfectants used by Braidwood and Vacher was considerably in excess of this (5 per cent. of carbolic acid and a saturated solution of potassium permanganate), indeed, the quantity injected was so great that it is difficult to decide whether the septic fluid or the antiseptic agent mixed with it was responsible for the death of the animals experimented upon.

In my experiments with disinfectants the result was very striking. In 46 instances the subcutaneous injection of virulent blood and serum from septicæmic rabbits, mingled with various antiseptic substances, gave negative results, whereas the virulence of the same fluids was demonstrated by comparative experiments in which a much smaller quantity was used, and by 35 experiments in which inefficient quantities of efficient antiseptic agents or solutions of substances which proved to be inert, were mingled with the virus. Thus carbolic acid failed at 0.5 per cent., but was efficient at 1.25 per cent.; potassium permanganate failed at 1 per cent., but was efficient at 2 per cent.; potassium nitrate and sodium chloride failed at 4 per cent., etc. etc.

¹ Board of Health Bulletin, July 23, 1881.

ARTICLE VI.

RUPTURE OF THE LEFT FALLOPIAN TUBE AND COPIOUS HEMORRHAGE INTO THE PERITONEAL CAVITY. By J. F. HARTIGAN, M.D., of Washington, D. C.

CASE I.—Mrs. S. T., coloured, æt. 33, mother of five children, youngest sixteen months old, menses irregular since its birth; was seized on the morning of September 12, 1881, with a sudden sharp pain low down in the abdomen; menstruation was a month overdue, and she remarked that this was perhaps its beginning; such belief was heightened the next day by a normal show which lasted up to death; there were no symptoms of pregnancy. She was well up to this time except that, her husband says, a few nights before in bed she felt cold and chilly, although the room was very warm, and requested him to put the window down; also, when he was leaving the house to go to work the morning of her attack, she expressed a desire to lay aside her laundry labours and take two weeks' rest.

When the pain seized her she had a cup of coffee in her hands getting breakfast; it continued growing worse, and felt, as she said, like labour pain. She, however, kept going about, complaining all the time; and would occasionally sit and lie down and go to work again; her strange conduct and actions in the mean time excited anxiety, and two days before her death great pallor was noticed, and she talked in a rambling way, indeed, as her sister said, she felt and looked as if she would die.

This state of things continued until the morning of the 17th, when she caught herself and exclaimed, "Oh, Lord! my stomach, that pain that I have been complaining of for a week is almost cutting me in two." She lay on the floor on her abdomen, steadily grew worse, and was then carried to a lounge. Dr. Winter was summoned, who soon afterwards found her unconscious in collapse, death ensuing about 5 P. M.

At the *autopsy* the next day the quantity of blood in the abdominal cavity was amazing; becoming satisfied that no large vessel was ruptured, some difficulty was experienced in learning the source of the hemorrhage. After sponging out the abdomen this was discovered by a clot protruding through what appeared upon examination, as the specimen shows, a rupture of the left Fallopian tube on its superior aspect, irregular in shape, one-fourth inch long, and an inch from the uterus; there was partial dilatation and attenuation of the walls of the tube in its middle; the finest probe would not penetrate the ostium internum; the ostium abdominale was open. The uterus was enlarged, five inches long, and empty, its rugæ, however, and lower garments of the woman, were found slightly tinged with the menstrual flow before referred to. There was also a true corpus luteum, of a dusky hue, included, perhaps, in one-sixth of the left ovary. Other organs normal.

The interest attached to the specimen led me to examine into its literature through the unsurpassed facilities of the index catalogue of the Army Medical Library; I am also indebted to Dr. Lamb and Mr. Z'glinitzki for translations.

CASE II.—The first reference to this subject, although not exactly an analogous case, is found in De Haen's *Ratio Medendi*, vol. iii., 1764, p. 31. The patient, who was 24 years old, had never menstruated, but had since the age of sixteen suffered with a hard swelling in the hypogastrium, which formed in the beginning an extremely hard but uniform zone around the umbilicus, and finally encompassed

the entire abdomen. After eight years of acute suffering it was discovered that she was afflicted with atresia. In 1761 an operation was determined upon by means of an incision into the hymen, when a great quantity of black blood escaped followed by death in a few hours..

The *autopsy* showed enormous moles of the uterus, and both sides of the monstrous tube formed together one solid mass that filled the whole hypogastrium. The abdominal cavity was filled with black, turbid, offensive fluid, which proved to have issued from small apertures of the decayed tube.

CASE III. (*Journal Universel des Sci. Medical*, Paris, vol. xxx., 1823, p. 100.)—Dr. Godelle reports a case, married, of rupture of right tube, supposed to have occurred in a rage, at the time of menstruation.

CASE IV. (*Sommaire des Trans. de la Soc. des Sciences Méd. du Dept. de la Moselle*, Metz, 1830–8, p. 63.)—Patient, æt. 38; no children; rupture of left tube three weeks over expected period. What appeared to be decidua was found in uterus. Rupture believed to be result of arrest of ovule in the tube.

CASE V.—A case is reported by William Munk, M.D., in the *London Med. Gazette*, vol. xxvii., 1841, p. 867. Patient, æt. 18, was found in articulo mortis, and died in a few hours; had never menstruated. Eighteen months before, at puberty, she suffered from headache, pain in the back and limbs, cold extremities, and dragging sensation in pelvic region. These symptoms soon subsided, but returned in five weeks; again ceased and then returned after a shorter interval. This state of things continued three or four months, the symptoms upon each recurrence remaining longer, whilst intermissions became shorter, so that at last there was no intermission but exacerbations occurring every fourth or fifth week. In January the lower part of the abdomen began to swell; pain in the pelvis, vomiting, and all the symptoms aggravated. In a few days, when stooping, she felt something give way within her, and the swelling and pain subsided temporarily. She died in four days.

Autopsy showed a large quantity of dark-red thickish fluid in the abdomen. Uterus larger than a man's fist and flaccid. On opening it found three or four ounces of same kind of fluid. Fallopian tubes distended so as to admit the little finger. A fissure about two inches in length was found near the fimbriated extremity of left tube, accounting for hemorrhage.

CASE VI. (*Casper's Wochenschrift*, 1846, Berlin, p. 325.)—A case is reported showing rupture of left tube six weeks after menses; patient was 37, married, and had children. The author attributed rupture to tubal pregnancy. A coagulum resembling a mole was found in uterus which was enlarged on ruptured side. Ostium internum closed.

CASE VII.—In the *Provincial Med. and Surg. Jour.*, London, 1848, p. 104, a case is reported by Mr. Russell, presented before the Birmingham Pathological Society, showing rupture of the left tube, supposed during the passage of an ovum, in a young newly married woman two weeks after menstruation. Mr. R. found her in collapse, abdomen tympanitic and tender; she referred her pain chiefly to præcordia; died in a few hours.

At the *autopsy* blood was found in abdomen and pelvis; the rupture was near junction of middle and inner third, the walls of ruptured portion thin and distended by a mass of fibrin in which no ovum was discoverable. Uterus enlarged and contained a deposit of decidua.

CASE VIII. (*Gaz. des Hôp.* Paris, 1847, p. 155.)—Case 36 years old, one child. The right tube was ruptured and dilated to the size of finger—tube contained clots—bloody mucus in uterus. Some days before death, had attendant catamenial discharge.

CASE IX.—In the *Bulletin de l'Académie de Médecine*, Paris, vol. xxi., 1855–6, p. 21, a case is reported during catamenial flow, æt. 39, mother of four children. Left tube was found ruptured at junction of inner third with outer two-thirds; the internal third for half its length was dilated and contained a blood clot. No tubal pregnancy. No trace of blood in uterus.

CASE X.—In Warren's *Surgical Observations*, 1858, p. 292, a case, æt. 40, is reported of rupture of left tube from retained menstrual fluid on account of occlusion of the uterus. There was no communication between tube and uterus. Patient had a very severe confinement four years previously, and had not menstruated since.

CASE XI.—A case is reported in the Extracts from the Records of the Boston Society for Medical Improvement, by Dr. F. Minot (*Boston Med. and Surg. Journ.* vol. lxiv., 1861, p. 249).

Autopsy, by Dr. L. R. Stone, showed rupture of the left Fallopian tube and copious effusion of blood into the peritoneal cavity in a non-pregnant woman. Patient was 19 years old, and had one child a year and a half old. The morning she was seized she got up as usual perfectly well, and dressed her child; went out a few minutes, came back and threw herself on the bed, complaining of pain in the abdomen, coldness and thirst, feeble pulse, and great pallor. She died the same evening. About two quarts of blood was found in abdomen; uterus not enlarged. Fallopian tubes more injected than the uterus, but neither of them was distended nor discoloured. The left tube in its upper and posterior part, midway, showed an opening through its entire thickness, about one-quarter of an inch long, and from this opening there hung a coagulum. Nothing like an ovum was anywhere found. The tube having been cut open it was found it could be inflated from the fimbriated extremity, and pass a probe in from the uterus to near the seat of rupture, but nothing more was observed than would be seen in the unimpregnated condition. There was a large spurious corpus luteum in left ovary, and a smaller one in the right. There was a glairy mucous secretion in the cavity of the uterus, and profuse leucorrhœal discharge in the vagina. The catamenia was always regular, and the sister, who slept with the patient, reports that she was not menstruating at the time of her death, but was daily expecting to.

CASE XII. (*Medicins Correspondenz Blatt.*, vol. xxxiv., 1864, p. 110.)—Dr. Lechler reports a case 28 years old; married 8 months; healthy; menstruated regularly, period five days overdue; thought she was pregnant. Was attacked suddenly after sleep while making her bed, and died in a few hours. At the autopsy there was observed great anæmia, and a large mass of blood in abdomen; left tube distended to size of walnut, with thin walls and blood clot; rent in anterior upper side. Uterus that of a virgin, healthy and empty. No trace of ovum was found.

CASE XIII. (*Trans. N. Y. Obst. Soc.*, 1876–8, p. 156.)—A specimen, taken from a lady æt. 30, was presented by Dr. H. D. Nicoll, showing rupture of the left tube. She suffered from retroversion for several years; had had two children within two years before death—labours normal. Last menstruation occurred two weeks ago and was scanty. Since that time she had slight abdominal pains. On the morning of her death, immediately after sexual intercourse, she experienced a sudden violent pain in the lower part of the abdomen, followed by syncope and unconsciousness; was pulseless at the wrist. A vaginal examination revealed distinct fluctuation in Douglas's cul-de-sac. She rallied a while after restoratives, but again became collapsed and pulseless, dying in 12 hours from attack.

Autopsy showed abdominal cavity absolutely filled with blood, chiefly coagulated, both ostium internum and abdominale open. Viscera anæmic. The uterus was large and the mucous membrane tumefied, and ovaries contained each a corpus luteum. The rupture took place half an inch from uterus; tube was swollen to the size of a hazel-nut, the opening being one-quarter of an inch long on the posterior aspect, and containing coagulum.

The pathologist, Dr. M. D. Mann, after describing the conditions found, concludes as follows: "We are forced by the resemblance of this to other described cases, by the presence of the corpus luteum, and by exclusion, to consider this as a case of tubal pregnancy. The absence of the ovum, and the failure in the development of the uteri decidua, usually seen in these cases, may cast some doubts on the diagnosis. But we can easily account for the absence of the ovum by supposing that it was expelled through the rent in the walls of the sac at the time of the hemorrhage and lost among the clots. We cannot imagine any other conditions which could have produced similar results. Disease of a vessel with apoplexy, an ulcerative action in the mucous membrane opening into a vessel, formation of an abscess in the tube, with subsequent rupture, are all easily excluded, on account of the healthy condition of the other tube, and the remaining portion of this."

CASE XIV.—Dr. A. E. A. Lawrence reports the following case in the *Trans.*

Obst. Soc. London, vol. xx., 1879, p. 292. Patient was admitted into the Bristol Gen. Hospital, suffering from endometritis, and for this he applied nitric acid to the interior of the uterus, after previously dilating the cervix with a tangle tent. The woman did well for four days, when peritonitis set in, and she died in three days. The *post mortem* showed peritonitis most marked in pelvic region. The left Fallopian tube was dilated into a cyst, the right was much dilated and thickened, and had given way; the interior of the uterus presented usual appearance of granular endometritis. The doctor did not attribute the fatal termination to the acid application; but he believed the immediate cause of the rupture was probably due to over-distension by menstrual secretion. Menstruation was coincident with the development of peritonitis.

CASE XV.—In the *Lancet* for 1879, vol. ii. p. 120. By Henry Fisher, M.D., rupture of both tubes is reported during labour. Woman 40, and feeble, temperate, and healthy; 5 children.

CASE XVI.—In the *Lancet* for 1880, vol. i. p. 525, a case is reported by C. J. R. Owen, M.R.C.S. Patient aged 39; married 20 years; had 4 children, youngest 21 months; no miscarriages; taken ill Jan. 8, 1880. Had rheumatic fever when young, but heart was not affected. Catamenia began at 14; natural every 4 weeks, latterly every 3 weeks; has lately grown fat, and her strength was severely taxed from nursing a sick child; last period was natural, but ever since has suffered much from pains in the back and stomach. January 7th she thought her period had come on, but as there was only a slight show, concluded it had passed off. Next morning she had been reaching about a good deal, when she suddenly felt "something give" in her right side, and fainted away. In the afternoon when she was first seen, she had been very sick, and only recovered from one faint to go into another. In the intervals she was sensible, and complained of severe pain in right iliac and hypochondriac regions, not increased by pressure. Face and hands cold and moist; no pulse in radial, carotid, or temporal arteries. Tongue clean, pale, and flabby; heart's action intensified; no bruit; chest normal, also abdomen. The doctor conjectured some small vessel had given way, but where, it was impossible to say. Ordinary remedies for collapse were ordered, and at midnight she rallied; pain much less; respiration 36, "sighing;" temperature 96.6° in mouth; radial was now felt at 120. Next day about noon she became unconscious and died soon after.

The *post mortem* showed much adipose tissue on abdomen; lungs and heart healthy. The abdomen was found to be full of thin pale blood; organs healthy, but very pale; from the right side a quart of thick black clots were removed; ovaries small, cystic, and atrophied; left Fallopian tube small. In the right one, one-quarter inch from uterus, an opening of the size of a horse-bean was seen, from which a little fibrinous material was oozing; the tube was enlarged throughout its entire length to the size of a pipe-stem, but where the opening existed it was as large as a No. 10 catheter. Uterus stained and congested near tube, and uterine mucous membrane thickened; the opening was in upper aspect of tube. The absence of peritonitis was thought remarkable, but it was probably due to exhaustion from the hemorrhage. The length of time the patient lived showed the bleeding was from a small vessel. The most plausible theory of the rupture seems to be that the patient caught cold at her period in December; that inflammation of the tube followed, possibly ending in abscess, and that the exertion brought about the fatal result.

CASE XVII.—Mr. Marsh, who made the autopsy, said before commencing the operation, that the last private examination he had made was on the body of a young unmarried lady who had caught cold at her period, and died from rupture of the Fallopian tube; and here also there was no peritonitis. He had never seen a similar case out of many thousand *post mortems*.

CASE XVIII.—A case by Dr. Godson, presented before the Obstetrical Society, appears in the *London Med. Times and Gaz.*, vol. i., 1880, p. 193. The patient, æt. 30, was married two months; menstruation had been regular; the period commenced four days before her death at its proper time. During this day whilst walking she suffered acute pain in the left iliac region, nearly fainting. This passed off, but recurred four days after while menstruating. Collapse and the general signs of internal hemorrhage followed, and she died in twelve hours.

Autopsy showed abdominal cavity to be full of fluid blood with large clots in

the pelvic portion. The left Fallopian tube was found distended in one part to the size of a small walnut, on the anterior aspect of which was a small irregular rent, which led into a cavity in the centre of what appeared to be organized blood clots. No evidence of an ovum could be discovered. The right ovary showed a well-marked corpus luteum. In the discussion that arose there was a difference of opinion as to whether or not tubal pregnancy existed. Dr. Godson could trace no signs, but he failed to account for the distension of the tube, both ends of which were patent.

CASE XIX.—In *New York Med. Journ.*, 1880, p. 522, is reported the case of a French woman, 49 years old, who had several children, complained of obstipation of fourteen days' duration. The *autopsy* showed signs of general peritonitis, and at the bottom of peritoneal cavity were found twelve ounces of pus. The right tube was dilated by a collection of pus, a rent in the sac showing the point where it had discharged. The left tube was also inflamed and dilated with exudation, but had not ruptured.

In the *St. Thomas Hospital Museum Catalogue*, London, vol. iii. p. 227, are found several specimens chiefly of cystic dilatation or degeneration, with occlusion of the tube.

The *post mortem* in the case of Miss Neilson, the actress, by Dr. Brouardel (*Med. Record*, vol. xviii., 1880, p. 363), disclosed rupture of a varicose vein in the left Fallopian tube, supposed to have occurred in her writhing. Two quarts and a half of blood were found in the peritoneal cavity, and the ruptured vein presented an orifice of from four to five millimetres in diameter.

According to Dr. W. E. Johnston, of Paris, for the last five years she had been under his treatment. She suffered principally from gastralgia, incident to dyspepsia, a form fantastic in its coming and going, and in her case dependent on moral causes as well as on errors of diet. Being out of the city, he did not attend her in the fatal attack, but he believed it might have been relieved then, as it often had been before, by a free use of morphine. Twelve hours from the commencement of her attack, during a most violent recurrence of the pain, she suddenly ceased to complain, went into a state of syncope, and died.

I have nothing to add in my case further than that I believe it to have been one of arrest of impregnated ovum in the tube. The enlarged uterus, the corpus luteum, and overdue menses, would seem to confirm this view. It may be admitted, also, that the bleeding had been going on slowly from the first moment of the attack, and suddenly increased the day of death. I am not convinced that a violent effort will rupture an organ in repose like a healthy Fallopian tube. If this were so it should occur oftener, for instance, during parturition, when the pressure and exertion combined are greater, perhaps, than in any other contingency. Another feature which must not be overlooked is, that all the ruptures occurred in married women, except the two cases who had never menstruated, and the one mentioned by Mr. Marsh. I cannot find a record of one attending the menstrual flow of a virgin. The interesting question, therefore, arises, can this accident, as claimed in one of the cases cited, and by Churchill and Rokitsanski, take place in a non-pregnant female without disease, atresia, or occlusion?

ARTICLE VII.

THE GEOGRAPHICAL AND CLIMATIC RELATIONS OF PNEUMONIA; A STATISTICAL STUDY. By E. SANDERS, M.D., late House Physician, Bellevue Hospital, New York; Attending Physician to Mt. Sinai Hospital Dispensary, Department of Internal Diseases.

ALMOST with the very birth of medicine attempts were made to trace the relations of climate to disease. From the nucleus created by the father of medicine, the number of works devoted to this subject has, with the increase of knowledge in other branches of medical science, gone on steadily increasing, till, at the present day, our shelves are fairly littered with them. Hippocrates paid particular attention to climatic influences, tracing out clearly, even with the imperfect appliances and lack of previous observations at his command, the characteristics assumed by diseases under the varying influences of heat and cold, wet and dry, and the directions of the winds, establishing from these relations the doctrine of medical constitutions, the deductions of which have hardly been surpassed even at the present day. Geographic distribution, however, he did not consider. Save in a few instances, climatic relations alone are those which seem to have attracted the attention of writers of the present day, and but little advance has been made in our knowledge of the geographic limits of disease. Yet as Charcot has said (*Clin. Lects. on the Diseases of Old Age*, N. Y., 1881, trans. by Leigh H. Hunt, p. 85), "Medical geography is, equally with historical pathology, one of the most fruitful means of investigation in etiological research. It enables us to become acquainted with the different regions of the globe in which certain diseases prevail, and thus allows upon the grandest scale a study of the cosmical, tellurial, and even anthropological conditions that may favour or hinder their development." In another place he further adds, "A medical geography has yet to be written. Under the influence of certain preconceived ideas, a deplorable confusion has arisen among all the diseases which trace their origin to cold; and it is easily understood how difficult becomes the task of criticism when observations made in remote regions are to be examined and tested," and to no disease may these remarks be more appropriately applied than to pneumonia, the disease which above all others has been supposed to be dependent upon cold as its great etiological factor. It has been truly said by Mühry that diseases have not been thrown at haphazard over the face of the earth. Each country has its own distinctive diseases, as well as its own fauna and flora. Diseases, like plants and animals, flourish only within certain geographical limits, or have a definite distribution where certain influences prevail, beyond which they cannot go without the risk of disappearing. Of all the climatic relations of disease, the most important is the latitudinal. Yet with

the exception only of a few of the epidemic and paludal maladies, no attention, or at least but little, has been paid to the geographic distribution of the various wide-spread or endemic diseases from which man suffers; and with relation to pneumonia, as regards this question, the disease with which we are more particularly concerned, there is but one article, as far as I am aware, devoted to the discussion of this subject, this being a statistical paper by Von Ziemssen, published many years ago, wherein it is claimed, on insufficient data I believe, that it cannot be maintained that pneumonia appears absolutely more wide-spread and more frequent in one climate than in another (*Canstatt's Jahrb.*, bd. ii., 1857, S. 119). It has been estimated (Juergensen, Korányi) that primary pneumonia comprises 3 per cent. of all sickness in France, Germany, and England, and 6 per cent. of all internal diseases, while it also causes 6.6 per cent. of all deaths, or 12.7 per cent. of the mortality from internal maladies. From statistics collected by me, I obtain for 68 cities of Europe, having an average death-rate of 26.7 per 1000 of population, a mortality from pneumonia of 6 per cent. of all deaths, or a death-rate of 1.6 per 1000 living; while for 106 American towns and cities, the average death-rate for these being 20.4 per 1000 inhabitants, the proportions are 6.1 per cent. of all deaths, or 1.2 in every 1000 population die of this disease. Besides these cities I have returns for 16 others, 4 being situated in Central America, 4 in South America, 2 in Asia, 2 in Africa, 2 in Australia, and one each in Cuba and the Sandwich Islands; these cities, showing an average death-rate of 47.4, have a mortality from pneumonia of 1.7 per 1000 living, while it causes 4.6 of all deaths. As an average of these 190 towns and cities the world over, I obtain for the disease the ratios 1.4 for each 1000 of population, or 5.9 per cent. of all deaths.

From the eighth and ninth census reports of the United States, the results obtained for the country as a whole, are a pneumonia rate of 0.98 per 1000 inhabitants, or 7.8 per cent. of all deaths are found to be due to pneumonia. The following table will show these death-rates for the various countries of the globe:—

	Pneumonia.			
	Per 1000 inhabitants.	Per cent. of deaths.	Death-rate.	No. of cities.
North America . . .	1.21	6.1	20.4	106
Central America . . .	1.82	2.6	84.8	4
South America . . .	1.61	5.8	30.9	4
Cuba . . .	1.40	2.8	43.0	1
Sandwich Islands . . .	0.61	2.0	37.4	1
Europe . . .	1.57	6.0	26.7	68
Asia (Hindostan) . . .	1.43	6.8	48.3	2
Africa . . .	3.62	9.1	39.4	2
Australia . . .	0.72	3.6	21.2	2
World over . . .	1.38	5.9	24.8	190

In a paper read before the New York Academy of Medicine, and published in the *Archives of Medicine*, June and August, 1881, I called

particular attention to the fact that pneumonia had a distinct, well-marked, and characteristic distribution over the face of the earth, but, at the same time, admitted that the statistics on which this conclusion was then based were too imperfect and scanty for anything like positive deductions. I quote from this article: "Pneumonia, all other things being equal, increases uniformly in frequency the nearer we approach the tropics. That is to say, and the fact is a surprising one, and one directly opposed to its presumed dependence on cold, the disease is more commonly met with, is more frequent in warm than in cold climates, and in hot than in warm climates, showing a gradually increasing ratio from the poles to the equator. Such is undoubtedly true of the United States; and as far as shown by the statistics I have been able to gather, which, it must be confessed, are not as numerous as could be wished, also of foreign countries." Since then I have succeeded in collecting a large series of statistics bearing upon this matter, from which I have been enabled to deduce the geographical and climatic relations of the disease. I shall first consider the various perturbing circumstances which may affect the distribution of the disease, taking up in detail the effects of altitude, rain-fall, temperature, actual population, and density of population, death-rate, longitude, etc. etc.; finally, discussing its most important relation, the latitudinal.

Obviously, it would be unsatisfactory and far from convincing to base any positive statements upon statistics obtained from hospitals, naval, military, or the like sources, as Ziemssen and Hirsch have done, since, in such cases, we are dealing only with a particular class, and not with the generality of humanity that goes to make up the population of a State. Besides, in the instances of soldiers and sailors, the circumstances under which they may be placed at different times may vary greatly, whether in garrison or in the open, at sea or on land, either in time of war or peace. No positive or unimpeachable conclusions can, therefore, be deduced as regards the geographical distribution of pneumonia from such data, although they may, perhaps, lend a certain amount of secondary evidence in this direction. The most absolute data can only be obtained from the returns of countries and cities, embracing, as they do, the entire population, subjected to relatively similar circumstances of environment. Hence, in the discussion of the various questions that may arise, all deductions will be drawn from such returns for cities and countries only, statistics of special classes being discarded as not of general application.

1. *Elevation or Altitude above the Sea-level.*—Toner, in the introduction to his *Dictionary of Elevations and Climatic Register of the United States*, New York, 1874, page v., writes, "We suppose it will be admitted without question, that in general the elevated regions of the world—the hills, the forests, and the high plateaus, and the mountains in the temperate and torrid zones—are more salubrious than the low alluvial and tide-water plains, and contribute more to the strength, vigour, hardihood

and, we might add, happiness of our race," while, later on, page xxiv., he further says, "we think it exceedingly probable that health and diseases of various types are as much affected by climatic influences, induced by altitude, as by latitude and longitude." Such being then the importance of this element on climate and disease, a careful study of its relations to pneumonia must obviously be of great interest.

It has been claimed, and the most prominent and emphatic among those who have made this claim is Lombard, that pneumonia increases in a direct ratio the higher we ascend above the sea-level. It is a well-recognized fact that pestilential diseases prevail, are more common, below, at, or near the level of the sea. The most prominent of this class is yellow fever, which never prevails on the mountain tops or on elevated plains, but always in places situated in low-lying lands or along the sea-board. Typhoid, dysentery, cholera, and the paludal fevers are also instances where a similar rule prevails. It will be observed that all of these are members of the miasmatic or miasmatic-contagious class of diseases, a class to which it is believed by many that pneumonia belongs. As already stated, Lombard has claimed to have proven that the disease is most common in the high uplands or near the mountain's top, stating that "in Switzerland and Germany we have noticed the gradual increase of pneumonia with the altitude as the uniform result of the observations of a great number of practitioners dwelling in the high regions of these two countries, these having enabled me to show the frequency of pneumonia as one of the characteristics of the climate of mountains" (*Traité de Climatologie Médicale*, tome iv., Paris, 1880, p. 392). Let us see how statistics bear out this assertion of Lombard's. Geneva, a city placed at 1280 feet above the sea-level, shows a death-rate from pneumonia of 1.1 per 1000 inhabitants; while Basle, situated fully 400 feet lower, presents a rate of 1.9 per 1000 living. Again, we have Munich, of which it has justly been said that but few cities of the world have so small a number of deaths from the disease, its rate being 0.54 per 1000 of population, yet it is located at an altitude of 1690 feet. Halle, with an elevation of but 364 feet, has a death-rate from this malady of 2.3 to every 1000 of its inhabitants; with Wurzburg, at 561 feet, having but 1.5; while Trieste, at 285 feet, shows the high rate of 2.3; Genoa, at 177 feet, presents 3.3; and Marseilles, at 150 feet, 3.7. Take a few examples from our own country. Denver, lying at an elevation of 5269 feet, has a death-rate of but 0.34; Boulder, at 5250 feet, a rate of 0.71; Winona, at 1500 feet, 0.81; Burlington, Iowa, at 940 feet, 0.38; while Augusta, Ga., at 185 feet, shows 3.0; Washington, D. C., at 45 feet, 2.19; New York, at 35 feet, 2.19; Jersey City, at 30 feet, 1.79; Savannah, at 20 feet, 3.52; Norfolk, at 15 feet, 2.21; and Stamford, Conn., at 10 feet, 1.86 per 1000 living. Such are but a few of many instances that might be presented. The relation of altitude to pneumonia, certainly in our own country, is positive, showing a gradually decreasing

ratio as we ascend, a conclusion, therefore, diametrically opposed to that of Lombard's. My statistics embrace those of the various States obtained from the eighth and ninth census reports, as also the returns for ninety-eight of our American towns and cities. The altitudes were obtained from Toner's work already quoted, and in each instance represent the mean elevation of the place or State above the sea-level.

For the States the following *résumé* is presented :—

No. of States.	Elevation.	Per 1000 inhabitants.	No. of States.	Elevation.	Per 1000 inhabitants.	No. of States.	Elevation.	Per 1000 inhabitants.
5	50 to 200 ft.	1.11	7	50 to 300 ft.	1.12	15	50 to 500 ft.	1.21
8	200 " 400 "	1.25	10	300 " 600 "	1.23	16	500 " 1000 "	0.85
4	400 " 600 "	1.13	13	600 " 900 "	0.85	7	1000 " 7000 "	0.78
8	600 " 800 "	0.83	4	900 " 2000 "	0.86			
6	800 " 1000 "	0.83	4	2000 " 7000 "	0.66			
4	1000 " 2500 "	0.79						
3	2500 " 7000 "	0.77						

Let us now review the returns for our cities.

No. of cities.	Elevation.	Per 1000 inhabitants.	No. of cities.	Elevation.	Per 1000 inhabitants.	No. of cities.	Elevation.	Per 1000 inhabitants.
49	0 to 200 ft.	1.30	56	0 to 300 ft.	1.32	68	0 to 500 ft.	1.30
13	200 " 400 "	1.44	22	300 " 600 "	1.16	26	500 " 1000 "	0.98
16	400 " 600 "	1.06	14	600 " 900 "	0.84	4	Above 1000 "	0.73
12	600 " 800 "	0.85	3	900 " 1200 "	0.86			
4	800 " 1000 "	0.97	3	Above 1200 "	0.62			
4	Above 1000 "	0.73						

Such are the facts drawn from the statistics of North America, and they certainly show in a most striking and decided manner the fact that with increase in elevation there is a coincident and gradual decrease in the mortality from pneumonia, all other things being equal. In studying this question, as related to the cities of Europe, I am met by the difficulty in obtaining the mean elevations of the various places, being enabled to do so only in thirty-nine instances. Still, as far as they go, they certainly seem to bear out the above conclusion, at least they cannot be claimed to contradict it.

No. of cities.	Elevation.	Per 1000 inhabitants.
28	0 to 500 feet.	1.83
9	500 " 1000 "	2.05
2	above 1000 "	0.82

Fonssagrives (*Hygiène et assainissement des Villes*, Paris, 1874, p. 75) has divided cities on the basis of the influence of altitude upon the climate of the locality, into five classes: 1st, those situated at an elevation of from 6560 to 14,150 feet; 2d, those at from 3280 to 6560 feet; 3d, those at from 985 to 3280 feet; 4th, those at from 165 to 985 feet; and, 5th, those from 15 feet below to 165 feet above the sea-level. Adopting this classification and arranging according to this principle cities the world over, I get the following results from the study of 146 such places :—

No. of cities.	Elevation.	Per 1000 inhabitants.
67	5th class.	1.38
71	4th “	1.47
5	3d “	1.08
2	2d “	0.53
1	1st “	0.61

Again, showing this steady decrease with increase in altitude. Now what are the opinions of authors upon this question of the relation of altitude to the pneumonia rate? Lombard, as already stated, believes that it steadily increases with increase in elevation, being most commonly met with on high uplands and the mountains, least in the low-lying valleys. He instances the so-called *Alpen-stich*. Unfortunately for his side of the question, this is not pneumonia, but rather a complex of diseases, being most frequently a malignant form of pleurisy. Besides, the very countries that he indicates, as well as the other States of Europe, are characterized not by the greater prevalence of the disease at high altitudes, but rather the contrary, as shown by the facts already quoted. Geneva, Wurzburg, Munich, Prague, Frankfurt, all present low death-rates from pneumonia, though situated at altitudes ranging from 427 to 1690 feet above the sea-level; whereas, Halle, Trieste, Paris, Bologna, Marseilles, all have high death-rates from the disease, though placed at points ranging at but from 200 to 375 feet above the surface of the sea. Hirsch apparently is of the opinion that the malady is common at high altitudes, but, as Juergensen justly claims, the data on which he bases this conclusion are not trustworthy. This latter author expresses himself as in doubt, though apparently leaning to an opinion opposed to that of the former. He, however, considers the question as still unsettled. Ziemssen, on the contrary, deduces from his statistics that the disease is most common in the plains.

2. *Rain-fall*.—It has been shown by Sturges that any considerable amount of wet has no tendency to heighten the pneumonia rate, the very lowest numbers of this disease, out of ten years, being found to follow weeks of excessive rain (*On Pneumonia; its Natural History and Relations; a Clinical Study*, London, 1876, p. 141). From such facts it would seem that pneumonia bore some relation to the rain-fall, still I am unable to trace such a connection clearly enough to convince myself of its existence. Although it is true, generally speaking, that the annual amount of precipitation increases the nearer we approach the tropics, still this increase is far from absolute or uniform, as a glance at Blodgett's Climatological Map of the United States, or the Precipitation Charts of the Signal Service Bureau, or the Map, by Prof. E. Loomis, of the mean annual rain-fall of the world (*American Journal of Science*, Jan. 1882), will show. A somewhat similar irregularity is found as regards the relations of pneumonia to the mean annual rain-fall, as shown by the following tables representing the results obtained from a study of 106 North American cities, the facts relating to the mean annual precipitation being ob-

tained from such standard sources as Blodgett's *Climatology of the United States*, Philadelphia, 1857; Annual Reports of the Chief Signal Officer of the United States; and Gray's *National Atlas*, Philadelphia, 1881, article on Climatology, by Lorin Blodgett, p. 215, *et seq.*, and Loomis's article in the *American Journal of Science*, already mentioned.

No. of cities.	Amount of rain.	Per 1000 inhabitants.	No. of cities.	Amount of rain.	Per 1000 inhabitants.
4	10 to 20 inches.	1.16	8	10 to 30 inches.	1.32
4	20 " 30 "	1.48	91	30 " 50 "	1.14
27	30 " 40 "	0.98	7	50 " 70 "	1.98
64	40 " 50 "	1.21			
5	50 " 60 "	2.42			
2	60 " 70 "	0.92			

The facts which I have collected relating to European cities are, unfortunately, as in the case of altitude, too few for anything like reliable deductions, though, as far as they go, they bear out the conclusion already arrived at.

No. of cities.	Amount of rain.	Per 1000 inhabitants.	No. of cities.	Amount of rain.	Per 1000 inhabitants.
4	15 to 20 inches.	2.62	10	15 to 25 inches.	2.26
17	20 " 30 "	1.44	17	25 " 35 "	1.24
10	30 " 40 "	1.29	6	35 " 45 "	1.33
2	40 " 50 "	1.88			

3. *Death-rate.*—It may be taken as a general conclusion that the nearer we approach the tropics the higher the death-rate in cities. This is undoubtedly true of both Europe and America, as might easily be shown here, but a discussion of such a question would carry us too far, and, besides, is foreign to our subject. The fact being granted, with increase in death-rate, it is found that there is a similar relative increase in the pneumonia rate, as clearly shown by the following, deduced from the study of 106 American, 68 European, and 8 other towns and cities scattered the world over.

Death rate per 1000 living.	Pneumonia-rate per 1000 living.				Both.		The world over.	
	America.	No. of cities.	Europe.	No. of cities.	Per 1000 inhabitants	No. of cities.	Per 1000 inhab's.	No. of cities.
5 to 10	0.38	1			0.38	1	0.38	1
10 " 15	0.81	17			0.81	17	0.81	17
15 " 20	1.09	34	0.80	2	1.07	36	1.07	36
20 " 25	1.20	33	1.34	25	1.26	58	1.25	61
25 " 30	1.83	15	1.43	29	1.57	44	1.57	44
30 " 35	1.34	5	2.59	7	2.07	12	2.20	13
35 " 40			2.35	5	2.35	5	2.12	7
40 " 45	3.52	1			3.52	1	2.28	3

The fact that the American cities show a lower death-rate than those of Europe, is explained in part on the ground, that of the latter my list embraces, save with a few exceptions, large cities only; whereas the former includes a great many of our smaller towns; it being a well-known

and recognized circumstance that the death-rate of a city bears a direct relation to the number and density of its population.

4. *Population—Density of Population.*—As might be expected, pneumonia occurs more frequently in large than in small cities, while cities taken as a class show a larger relative death-rate from the disease than the country, that is city dwellers suffer from the disease to a greater extent than those belonging to the rural population. This is not a new fact, for both Ziemssen and Hirsch have shown such to be the case many years ago. Still, to render certainty doubly sure, a simple statement can hardly be considered sufficient, and the following table is, therefore, presented, giving a comparison between various States and cities of States:—

States.	Per 1000 inhab's.			States.	Per 1000 inhab's.		
	State.	Cities.	No. of cities.		State.	Cities.	No. of cities.
Ala.	1.47	1.44	2	Miss.	1.68	0.84	1
Ark.	2.98	3.48	1	Mo.	1.41	1.28	1
Cal.	0.65	1.15	4	Neb.	0.93	1.15	1
Col.	0.48	0.53	2	Nev.	1.18	2.61	1
D. of C.	0.98	2.19	1	N. H.	0.96	1.13	1
Conn.	0.72	0.95	11	N. J.	0.59	1.28	3
Del.	0.68	0.84	1	N. Y.	0.87	1.13	13
Fla.	1.39	0.97	1	N. C.	0.80	1.08	1
Ga.	1.17	3.26	2	Ohio,	0.65	0.94	5
Ill.	0.96	0.82	4	Penna.	0.58	0.99	6
Ind.	0.88	1.07	4	R. I.	0.78	1.15	2
Iowa,	0.61	0.38	1	S. C.	1.26	1.26	1
Ky.	0.95	1.24	2	Tenn.	1.04	1.60	3
La.	1.75	1.55	1	Texas,	1.58	1.53	3
Md.	0.70	1.33	1	Vt.	0.59	1.06	1
Mass.	0.98	1.33	12	Va.	0.94	1.34	5
Mich.	0.67	0.83	2	W. Va.			
Minn.	0.39	0.87	2	Wis.	0.50	0.82	1

Thus in 27 instances the pneumonia-rate is less throughout the State than in its cities, whereas the contrary held in but 9 instances. The same can be shown of foreign countries. Turning to Europe, we find a similar condition of affairs prevailing.

	Per 1000 inhabitants.		No. of cities.
	Country.	Cities.	
Belgium	0.85	1.74	2
Germany	1.34	1.54	19
England and Wales	1.03	1.22	13
Ireland	0.31	0.54	4
Scotland	0.73	1.12	8
Norway and Sweden	1.60	2.00	2
Switzerland	1.50	1.71	3
Italy	1.85	2.95	3

Showing in every instance a pneumonia death-rate in cities exceeding the average for the entire country; clearly indicating a greater predilection of city dwellers for the disease.

Again, statistics show that the disease is more common in large than in small cities; a fact that would almost necessarily follow from the preceding. For North America a *résumé* of 106 towns and cities, for Europe 70, and for the world over a total of 185, shows—

	North America.	No. of cities.	Europe.	No. of cities.
Over 500,000 population . . .	1.55	4	1.99	7
From 200,000 to 500,000 population	1.44	6	1.97	14
“ 100,000 “ 200,000 “	1.29	10	1.58	27
“ 50,000 “ 100,000 “	0.98	13	1.35	16
“ 10,000 “ 50,000 “	1.21	67	1.19	6
Less than 10,000 “	1.10	6		

	N. America and Europe.	No. of cities.	World over.	No. of cities.
Over 1,000,000 population . . .	1.66	4	1.66	4
From 500,000 to 1,000,000 population	1.93	7	1.86	8
“ 200,000 “ 500,000 “	1.81	20	1.75	22
“ 100,000 “ 200,000 “	1.49	37	1.47	39
“ 50,000 “ 100,000 “	1.18	29	1.28	31
“ 10,000 “ 50,000 “	1.21	73	1.21	75
Less than 10,000 “	1.10	6	1.10	6

That crowd-poison bears a more or less direct etiological relation to pneumonia has more than once been referred to by authors. According to returns from various sources, the disease would seem to be considerably more frequent in the poorer quarters of towns than among the wealthy. In the reports of a number of epidemics of pneumonia, overcrowding plays a very important part, occurring as they did in cloisters, prisons, barracks, on board ship, in tenements, and the like. That the disease is most frequent in the poorer quarters of Paris has been positively proven by Vacher. Thus he shows that the proportion of deaths by pneumonia is about twice as large in the poor arrondissements as in those of the rich, four of this latter class exhibiting a rate of 0.89 per 1000 inhabitants, while four poor districts presented a rate of 1.74 per 1000 of its dwellers (*Etude Méd. et Statistique sur la Mortalité, etc., en 1865*, Paris, 1866, p. 139). That the same is true of our own cities might easily be demonstrated; suffice here the simple statement that statistics prove such to be the case. It may be considered the rule that in cities the districts in which the poor reside show greater density of population than the quarters of the better classes. Hence, if this frequency of the disease among the poor be dependent upon overcrowding or crowd-poison, the death-rate from this malady should vary with the density of population. That such is the case is proven by such figures as the following:—

Inhabitants per square mile.	North America	No. of cities	Europe.	No. of cities	Both.	No. of cities	World over.	No. of cities
60,000 to 70,000 persons			1.76	2	1.76	2	1.76	2
50,000 “ 60,000 “	2.19	1	1.88	2	1.98	3	2.07	5
40,000 “ 50,000 “			1.73	3	1.73	3	1.73	3
30,000 “ 40,000 “	0.85	1	1.54	3	1.37	4	1.37	4
20,000 “ 30,000 “	1.55	3	1.18	6	1.30	9	1.30	9
10,000 “ 20,000 “	1.37	8	1.18	6	1.29	14	1.29	14
5,000 “ 10,000 “	1.16	17	1.95	2	1.25	19	1.25	19
1,000 “ 5000 “	1.17	12	2.06	1	1.24	13	1.24	13
Less than 1000 “	1.43	4			1.43	4	1.43	4

Still further evidence is found in the connection between the pneumonia-rate and the number of dwellers per house of each city. I have succeeded in establishing this relation for 41 cities of the United States, with a result bearing out in a most unmistakable manner this assumed dependence upon crowd-poison.

Inhabitants per house.	Per 1000 inhabitants.	No. of cities.
14 to 15	2.19	1
8 " 9	1.64	4
7 " 8	1.16	6
6 " 7	1.31	17
5 " 6	1.10	13

5. *Temperature.*—To me the etiological factor cold has appeared very much like the pathological term "functional," merely an expression of our ignorance. As our knowledge of morbid anatomy increases, the number of so-called functional diseases steadily grows less. And so it is with maladies assumed to be due to "catching cold;" a class which the older physicians were so fond of grouping under the generic name of rheumatic affections, one formerly embracing a large number of diseases. Were it true that pneumonia is directly related to cold, it would necessarily follow that, with a low mean annual temperature, the pneumonia-rate must undoubtedly be high. Now to settle this question with as much certainty as possible, it is deemed best to study it from all points, being well aware that, if the geographical distribution bear any definite relation to the temperature, by such a study alone can this fact be made apparent. It will hardly be disputed that, generally speaking, the nearer the equator, the higher the mean annual temperature of a place—the nearer the poles, the lower the temperature. Rochard (*Nouveau Dictionnaire de Méd. et de Chirurg. Pratiques*, tome viii., Paris, 1868, art. Climat.) has divided climates as related to temperature into five classes: 1st, the torrid, extending from the thermal equator to the isothermal line of 77° F.; 2d, the warm, extending from the line of 77° F. to that of 59° F.; 3d, the temperate, comprised between that of 59° F. and that of 41° F.; 4th, the cold, lying between the isothermals of 41° F. and 23° F.; and, 5th, the polar, between 23° F. and 5° F. For the first and fifth of these classes, statistics of pneumonia are almost entirely wanting, and, when obtained, so very imperfect as to be absolutely useless for our purpose. Those that I have arranged, according to this classification show for warm climates an average of 1.70 deaths from pneumonia for each 1000 of population, based on the returns of 157 cities; while cities located in the temperate climates present an average of 1.31 per 1000 inhabitants, deduced from the returns of 15 cities.

Contrary to what has been maintained by many, a high mean annual temperature means a high death-rate from pneumonia. The proof of this statement lies in the various tables now presented.

Thus, for North America and Europe, a tabulation of 172 towns and cities shows such to be a fact in a most striking manner.

Mean temp. (F.)	North America.	No. of cities.	Europe.	No. of cities.
65° to 70°	1.70	11		
60° " 65°	1.72	4		
55° " 60°	1.41	9	2.36	5
50° " 55°	1.21	27	1.54	17
45° " 50°	1.00	50	1.47	44
40° " 45°	1.01	3	1.99	2

Again, according to Boudin, it has been shown that in the Northern Hemisphere, in the system of Eastern America, that is, along the Atlantic seaboard, the mean annual temperature increases according to a certain definite ratio. Thus, for each degree of latitude from the coast of Labrador to Boston, the increment of increase is 1.58° F.; from Boston to Charleston, S. C., 1.71° F.; from Charleston to the Tropic of Cancer, 1.19° F. In Central Europe, between the parallels 71° and 38°, the temperature rises uniformly 0.90° F. for each degree of latitude. Constructing a table on this basis, to show that there can here be no mere juggling of figures, we obtain for North America:—

Latitude (N.)	Mean temp. (F.)	Pneu. per 1000 inhabitants.	Increment of increase in temperature.	Pneu. increase or decrease.		Increment of increase or decrease of pneu.
				Per 3° lat.	Per 1° lat.	
29°-32°	70° to 66.4°	1.275	1.58°	1.061(—)	0.354(—)	0.354(—)
32 -35	66.4 " 61.7	2.336		1.014	0.338	
35 -38	61.7 " 56.6	1.332	1.71	0.097	0.032	0.142
38 -41	56.6 " 51.4	1.224		0.165	0.055	
41 -44	51.4 " 46.5	1.059	1.19	0.164	0.055	0.055
44 -46	46.5 " 43.4	0.885				

Or arranging according to a slightly different method we get:—

Latitude (N.).	Mean temp. (F.).	Pneumonia per 1000 inhabitants.	Increase or decrease in pneumonia.	
			Per 5° of lat.	Per 1° of lat.
29°-30°	70° to 68.8°	1.267	0.647 (—)	0.129 (—)
30 -35	68.8 " 61.7	1.914	0.626	0.125
35 -40	61.7 " 53.1	1.288	0.216	0.043
40 -45	53.1 " 44.9	1.072	0.224	0.045
45 -46	44.9 " 43.4	0.847		

While for Europe these relations are:—

Latitude (N.)	Mean temp. (F.).	Pneumonia per 1000 inhabitants.	Increase or decrease in pneumonia.	
			Per 5° of lat.	Per 1° of lat.
43°-46°	58° to 56.2°	2.917	1.062	0.354
46 -49	56.2 " 53.5	1.855	0.335	0.112
49 -52	53.5 " 50.8	1.520	0.342	0.114
52 -55	50.8 " 48.1	1.178	0.012	0.004
55 -58	48.1 " 45.4	1.166	0.825 (—)	0.275 (—)
58 -60	45.4 " 42.7	1.991		

Or again—

Latitude (N.).	Mean temp. (F.).	Pneumonia per 1000 inhabitants.	Increase or decrease in pneumonia.	
			Per 5° of lat.	Per 1° of lat.
43°-45°	58° to 53.5°	3.515	1.585	0.317
45 -50	53.5 " 49	1.930	0.634	0.127
50 -55	49 " 44.5	1.296	0.020 (—)	0.004 (—)
55 -60	44.5 " 42.7	1.316		

Showing an almost steady increase in the pneumonia death-rate with a higher rate of mean annual temperature. It will be observed, however, that in the case of both North America and Europe there is a marked exception to this rule, in the former for the highest temperature, 68.8° to 70°, showing a decrease of 0.647 per 1000 of population in the pneumonia death-rate, while in the latter this is offset by a depression of 0.825 for low temperature, 45.4° to 42.7°. Thus, following Boudin's data, in whatever way we examine the relation of mean annual temperature to the pneumonia-rate, we find the same rule holding good; with increase in the former there is an almost uniform increase in the latter.

Turning now to the relation of the prevalence of the disease in various countries to this question. I have elsewhere shown (*Arch. of Med.*, June, 1881) that for the United States, the disease is more frequent in our Southern than in our Northern States, the former having a much higher annual temperature than the latter; and so clearly is this shown by the figures there presented, obtained from the eighth and ninth census reports, and so important do I deem them in the discussion of this point, that I again present them here in the form of a *résumé*, so modified, however, as to show at a glance their thermometrical relations to the malady.

No. of States.	Mean temperature (F.).	Pneumonia per 1000 inhabitants.
1	36.2°	0.39
4	40.8° to 44.6°	0.71
10	45.9 " 49.6	0.80
8	51. " 54.6	0.86
6	55.3 " 58.6	0.96
6	60. " 64.	1.46
3	66.4 " 69.6	1.41

Again, showing this steady increase before indicated, with, at the same time, the slight decrease for very high temperatures, a significant coincidence. For Europe the following is the result:—

No. of countries, etc.	Mean temperature (F.).	Pneumonia per 1000 inhabitants.
1	35.5°	0.79
7	42.° to 49.5°	1.06
3	50. " 58.	1.22

On studying this question after another method, that is by tabulating according to the mean annual temperatures and average pneumonia-rates of the cities of the various countries of Europe for which I have returns, the result as reached may be shown as follows:—

Countries.	Average mean temp. (F.) of cities.	Pneu. per 1000 inhabitants.	No. of cities.
Norway and Sweden	42.2°	1.99	2
Denmark	45.7	1.57	1
Prussia	48.2	1.57	14
England and Wales	48.3	1.22	13
German Empire	48.5	1.54	19
Scotland	48.8	1.12	8
Switzerland	48.8	1.71	3
Bavaria	49.3	1.02	2
Netherlands	49.8	1.90	2
Belgium	50.4	1.74	2
Austro-Hungary	51.1	2.42	4
Ireland	52.0	0.54	4
France	54.6	1.90	6
Italy	55.2	2.95	3

RÉSUMÉ

Average mean temperature.	Per 1000 inhabitants.	No. of countries.
42.2°	1.99	1
45.7° to 49.8°	1.46	8
50.4 " 54.6	1.65	4
55.2	2.95	1

6. *Relations to the Sea Coast.*—I had at first thought that those cities situated near or on the sea presented a greater prevalence of pneumonia than inland towns, but a more careful study of my statistics soon convinced me that such was not the case. As regards North America, lake ports show a smaller rate than inland towns, and these latter than sea-port towns, that is those situated on the ocean; while the relation for European cities differs somewhat from the foregoing, those located along the shores of inland seas presenting the largest mortality from the disease, next in order coming inland cities, ocean ports, properly so-called, exhibiting the lowest mortality. Thus:—

	Europe.	No. of cities.	North America.	No. of cities.
Lake or inland sea-ports	2.80	5	0.86	10
Ocean ports	1.07	14	1.36	26
Both	1.52	19	1.22	36
Inland towns	1.59	49	1.21	70

In the case of Europe, the cities situated along the shores of inland seas are, principally, those along the Mediterranean, thus accounting for the high rate of the pneumonia mortality; for it is a well-pronounced fact that cities placed on, or near, this sea, show a remarkable prevalence of the disease: Turin, Trieste, Bologna, Genoa, and Marseilles, all presenting an unusually high death-rate from this malady, ranging between 2.3 per 1000 living for Turin and 3.7 for Marseilles; while Algiers, placed on the southern shore of this sea, shows the exceedingly high rate of 3.8 per 1000 inhabitants.

7. *Longitude.*—In North America, as we pass westward, we observe a gradual but steady increase in the mortality from pneumonia, while, on the contrary, the reverse is true of Europe, for here there is a steady rise from west to east; a fact which it must be conceded is rather significant,

indicating in a most marked manner a positive relation to longitude. The increase being in the instance of the former country from east to west, and for the latter from west to east, there must necessarily be some intermediate line, possibly several lines, some degree or degrees of longitude, along which the disease must be supposed to reach its maximum of frequency. For North America my statistics of cities cover about 55 degrees of longitude, from the 70th to 125th meridian west from Greenwich; while for Europe they cover 40 degrees, that is from about 10° west to 30° east. Of the 106 American cities, all but eight lie east of the 100th meridian, hence the data of those beyond this meridian are to be considered very imperfect, allowing of no positive deductions. Those for Europe, however, are more evenly distributed, and, therefore, permit of more definite conclusions being drawn.

North America. Longitude (W.).	Pneu. per 1000 inhab's.	No. of cities.	Europe. Longitude.	Pneu. per 1000 inhab's.	No. of cities.
70° to 75°	1.17	38	10° W. to 5° W.	0.54	4
75 " 80	1.20	20	5 W. " 0	1.11	22
80 " 85	1.05	13	0 " 5 E.	1.81	7
85 " 90	1.26	15	5 E. " 10 E.	1.97	16
90 " 95	1.40	9	10 E. " 15 E.	1.55	14
95 " 100	1.47	3	15 E. " 20 E.	2.68	4
100 " 105	0.34	1	20 E. " 25 E.		0
105 " 110	0.71	1	25 E. " 30 E.	3.74	1
110 " 115	2.30	1			
115 " 120	1.80	2			
120 " 125	1.21	3			

Thus we observe from the above, that for North America there is an almost unbroken augmentation in the pneumonia mortality as we advance from the meridian of 70° to that of 100°. Beyond this line, as before indicated, we see that the data are too few for anything like receivable deductions. For Europe the result is the same for from 10° W. to 30° E., and even here more markedly than in the case of the former.

This fact holds true also of our various States, at least the data furnished by the 8th and 9th census reports point in a most positive manner in this direction. Without giving the statistics for the individual States, a simple *résumé* is deemed sufficient for our purpose.

States wholly or in great part between Long. (W.)	Pneu. per 1000 inhab's.	Pneu. per 1000 deaths.	No. of States.
65° and 75°	0.75	56.34	7
75 " 85	0.89	72.90	12
85 " 95	1.22	94.90	12
95 " 105	1.33	101.62	3
105 " 115	0.48	50.67	1
115 " 125	0.72	61.28	3

Again showing, we observe as in the case of the cities, this diminution in the pneumonia-rate after we have passed the 100th meridian. This may possibly be due to the paucity of our data beyond this line; yet as it occurs in both cases of cities and States, it is but fair to suppose that it indicates more than a simple coincidence.

8. *Latitude*.—Turning now to the most important element in the discussion of the geographical and climatological relations of pneumonia, latitude. It was claimed, quoting from a previous publication, in an earlier part of this article, that the nearer we approached the equator the more frequent the disease became. That this is true of countries from which reliable data have been obtained will presently be shown. Including all lands, statistics, good, bad, and indifferent, do not, however, seem to bear out this statement in its entirety; but only in so far as to prove a steady increase up to a certain parallel of latitude, for America apparently the 35° N., for Europe the rise being steady as far as my figures go, where the malady reaches its maximum, and beyond which it appears to diminish in frequency. Hence, a modification of the above conclusion would seem in order. Still, it may be maintained that nearness to the equator increases the tendency of man to suffer from this complaint, the uncertainty and lack of statistics for low latitudes being remembered. But let us see the actual facts. There is no geographical element so important in regulating the climate of a place as the latitude of that place. This goes without showing and cannot be disputed. Hence a careful discussion of its influence on pneumonia must be here entered into. Before proceeding to this let us first pass in review the opinions of authors on the question of the climatic and geographical relations of the disease.

Grisolle (*Traité Pratique de la Pneumonie*, Paris, 1841, p. 124) maintains that "pneumonia occurs in all countries of the globe, but its frequency is not the same in all. It is regarded as being a malady common in cold climates, rarer in temperate climates, and above all rarest in equatorial regions." Such is also the opinion of so great an authority as Lombard, who, writing as late as 1880 (*loc. cit.*, p. 391), claims that "the documents which I have passed in review are unanimous upon the great frequency of pneumonia in the cold regions." Reading further, we find that this claim is based upon the "documents" relating to polar America, New Britain, Labrador, this latter in particular, and Greenland. We may fairly conclude that deductions from such premises must be, to say the least, very imperfect and unsatisfactory, all facts relating to such places consisting merely in simple statements, unsupported by figures. He further adds that the foregoing is also true of the northern parts of Norway, of Sweden, of Finland, of Russia, and of Siberia; yet statistics for which, excepting, perhaps, for the first two, are wanting, or, if in existence, of so imperfect a character as to be absolutely useless. Such are his conclusions from such facts. As the result of the examination of a large number of statistics, chiefly, however, relating to soldiers and sailors, Ziemssen (*Canstatt's Jahrb.*, bd. ii., 1857, S. 130) concludes that it cannot be maintained that it (pneumonia) appears absolutely more widespread and more frequent in one climate than in another; while Hirsch (*Handbuch der historisch-geographischen Pathologie*, 2er bd., Erlangen,

1862-1864, S. 20) has reached the same conclusion from a study of another series of statistics. Pneumonia and pleuritis, he claims, as primary diseases, appear at all points of the earth's surface, and if in certain regions more frequently than in others, yet entirely different from and to a far less degree dependent upon climatic influences, than catarrh and bronchitis, which he elsewhere shows to increase steadily in frequency from the equator to the poles. Juergensen (*Ziemssen's Cyclop. of Med.*, vol. v., p. 13, Amer. Trans.) holds the same opinion as the two authors just quoted; further claiming, however, that the belief that the malady becomes more frequent as we advance from the higher latitudes to the tropics, is also not true; stating "that the statistics we already possess are amply sufficient to establish it. Its importance need hardly be discussed here"—in this summary manner dismissing the subject from further discussion. Fonssagrives (*Dict. Encyclopéd. des Sc. Méd.*, tome xviii., 1876, art. climat.) is the only authority, as far as I am aware, who holds an opinion directly opposed to those of the authors already quoted; yet, as we shall see, his conclusions are reached from a study of the very statistics from which Grisolles derived his conclusions. "The geographical domain of pneumonia," he writes, "offers a distribution, if not completely the reverse of that of hepatitis, at least opposed to it. This malady spares, doubtless, neither climate nor race, but has for certain climatological conditions (formules) a predilection which we here demonstrate. We have, in order to convince ourselves of this, but to read the complete article which Grisolles, applying the important documents furnished by J. Rochard and Le Roy de Mericourt, has written upon the geographic distribution of pneumonia. He shows us that this malady, very rare in the polar climates in spite of the inclemency of its temperature, increases in frequency from 60° north latitude, already presenting itself with a certain amount of vigour in Sweden and Denmark; increasing in Germany; becoming still more frequent in England, where it kills 19,000 to 20,000 persons a year; showing itself with greater frequency in France, where it furnishes 8.5 per cent. of the general mortality; presenting itself with an almost equal intensity in Italy and in Spain, but, leaving here, becoming somewhat rarer as we advance towards the south, constituting in the tropical countries, as I have myself shown, a kind of nosological rarity." I have quoted this author so fully because his conclusions almost exactly coincide with those I have reached. It must be here stated, that at the time that the conclusion, that pneumonia increased in frequency as we pass from high to equatorial latitudes, was arrived at by me, I was totally unaware of Fonssagrives's; hence, the conclusions reached must be considered as independent, although his preceded mine in point of time, and as lending support to each other.

The statistics on which my deductions are based will now be passed in review :—

United States.

States.	Latitude (N.).	Pneu. per 1000 inhabitants.	Pneu. per 1000 deaths.
Minnesota	43 ^o 30'–49 ^o	0.39	55.30
Maine	43 –47 ^o 30'	0.62	51.22
Vermont	42 44'–45 ^o	0.59	55.58
New Hampshire	42 42–45 18'	0.96	62.46
Wisconsin	42 47–47	0.50	54.55
Oregon	42 –46 ^o 18'	0.34	55.76
Michigan	41 42'–48 ^o 22'	0.67	69.74
Massachusetts	41 14–43 53	0.98	59.29
Rhode Island	41 18–42 03	0.78	58.23
Connecticut	41 –42 ^o 03'	0.72	55.96
Iowa	40 36'–43 ^o 30	0.61	75.32
New York	40 29'–45	0.87	60.28
Nebraska	40 –43 ^o	0.93	87.30
Pennsylvania	39 55'–42 ^o 15'	0.58	44.84
New Jersey	38 55'–41 21	0.59	51.61
District of Columbia	38 51'	0.98	60.87
Delaware	38 28'–39 ^o 50'	0.68	56.41
Ohio	38 21'–41 58	0.65	60.27
Maryland	37 53'–39 44	0.70	59.59
Indiana	37 46–41 46	0.88	80.66
Colorado	37 –41 ^o	0.48	50.67
Kansas	37 –40 ^o	1.49	112.13
Illinois	36 59–42 ^o 30'	0.96	77.94
Virginia and West Va.	36 31–40 40	0.94	75.66
Kentucky	36 30–39 06	0.95	78.49
Missouri	36 –40 ^o 30'	1.41	103.96
Nevada	35 –42	1.18	81.30
Tennessee	35 –36 30'	1.04	84.03
North Carolina	33 49–36 30'	0.80	71.34
Arkansas	33 –36 30	2.98	183.42
California	32 28–42	0.65	46.77
South Carolina	32 04–35 ^o 13'	1.26	102.58
Mississippi	31 52'–35	1.68	127.21
Georgia	30 20'–35	1.17	99.54
Alabama	30 15'–35	1.47	123.81
Louisiana	28 56'–36 30'	1.75	94.15
Texas	25 51'–36 30	1.58	104.43
Florida	24 30'–31	1.39	113.55

Comparing the 19 States lying wholly, or in great part, above the 39th parallel of latitude with the 19 lying below this line, we find an average pneumonia death-rate for the former of 0.69 per 1000 living, or a mortality of 6.1 per cent. for all deaths, and 1.27 per 1000 population, or 9.4 per cent. of the entire mortality for the latter. That is, pneumonia is actually about twice as frequently met with, or about one and a half times as common a cause of death, in the Southern as in the Northern States. Or, constructing a table on another basis so as to show more clearly this latitudinal distribution of the disease, we obtain the following:—

No. of States.	States wholly or in great part between the	Pneu. per 1000 inhabitants.	Pneu. per 1000 deaths.
1	25th and 30th parallels.	1.39	113.55
8	30th and 35th “	1.58	113.31
13	35th and 40th “	0.93	73.14
14	40th and 45th “	0.72	61.85
2	45th and 50th “	0.51	53.26

Showing a marked and undoubted dependence upon latitude. Turning now to European countries. Here my statistics are few, and rather unsatisfactory; the difficulty being that, in most of these States, pneumonia, bronchitis, and pleurisy are returned under one head, thus rendering such data useless for separate consideration. However, as far as they go, the deductions are the same as those for our own country. Thus:—

States, etc.	Latitude (N.)	Countries, etc.		Cities.		No. of cities.	Death-rate.	
		Per 1000 inhab's.	Per 1000 deaths.	Per 1000 inhab's.	Per 1000 deaths.		Cities.	Countries.
Italy,	36°35'–47°	1.85	126.3	2.95	97.6	3	30.2	29.5
Austro-Hungary }	42 –51			2.42	68.9	4	36.1	35.4
France,	42 20–51 05'		85.0	1.90	64.3	6	28.6	24.3
Switzerland	45 48–47 49	1.50	77.8	1.71	73.0	3	24.0	24.0
German Empire, }	47 20–55 50	1.34	60.0	1.54	59.0	19	26.8	27.2
Bavaria,		1.40	47.6	1.02	36.0	2	33.4	28.8
Prussia,		1.05	39.2	1.57	74.7	14	26.2	26.6
Belgium,	49 27–51 30	0.85	45.0	1.74	61.6	2	25.5	19.2
England and Wales }	49 57–55 47	1 03	46.7	1.22	51.5	13	24.1	21.8
Netherlands	50 43–53 33			1.90	74.9	2	26.3	24.4
Ireland	51 26–55 23	0.31	19.3	0.54	17.7	4	28.6	16.1
Denmark	54 30–57 45			1.57	63.7	1	23.9	22.6
Scotland	54 42–58 40	0.73	38.2	1.12	47.4	8	23.5	20.5
Norway & Sweden }	55 15–71 10	1.60	64.7	1.99	76.0	2	23.6	18.6
Foroe Isles	61 20–62 30	0.71	44.9					15.8
Iceland	63 23–66 33	0.79	31.8					25.5

Again showing an almost uninterrupted decrease as we pass northward from Italy to the northernmost countries of Europe; the only marked exception to this rule being the instance of Sweden and Norway.

So much for the various States and countries; let us now turn our attention to the bearing of the statistics derived from the various cities of America and Europe upon the latitudinal relations of pneumonia. A single *résumé* is here presented, since a detailed list of all the cities would occupy too much time and space, without, even, then showing in a sufficiently clear manner these relations.

United States.

Latitude (N.).	Pneu. per 1000 inhab's.	Pneu. per 1000 deaths.	No. of cities.	Latitude (N.).	Pneu. per 1000 inhab's.	Pneu. per 1000 deaths.	No. of cities.
29° to 32°	1.28	51.31	7	29° to 30°	1.27	46.32	3
32 “ 35	2.34	84.36	6	30 “ 35	1.91	72.64	10
35 “ 38	1.32	57.80	10	35 “ 40	1.29	60.41	28
38 “ 41	1.22	60.91	32	40 “ 45	1.07	60.54	64
41 “ 44	1.06	61.11	46	45 “ 46	0.85	29.16	1
44 “ 46	0.89	51.36	5				

Europe.

Latitude (N.).	Pnen. per 1000 inhab's.	Pnen. per 1000 deaths.	No. of cities.	Latitude (N.).	Pnen. per 1000 inhab's.	Pnen. per 1000 deaths.	No. of cities.
43° to 46°	2.92	93.49	7	43° to 45°	3.52	114.97	4
46 " 49	1.86	73.28	10	45 " 50	1.93	72.11	15
49 " 52	1.52	57.13	8	50 " 55	1.30	51.44	38
52 " 55	1.18	48.49	22	55 " 60	1.32	54.17	11
55 " 58	1.17	59.21	9				
58 " 60	1.99	76.47	2				

View this question as we may, no matter in what manner we arrange these statistics, still in each and every instance the result is the same. It will be observed that the disease seems to reach its maximum along a certain parallel of latitude in the cases of both America and Europe, this being in the instance of the former apparently the 35th, and as we pass northward towards the colder regions a steady diminution in the mortality from the disease is observed; this rule prevailing with but few exceptions, all other things being equal. Such, we have shown, is true not only of the cities, but of the various countries also. In an earlier portion of this article (see page 83) a table is given showing the average death-rates from pneumonia in the various cities of the world, 190 in all, which I have collected, this point being there shown in a most positive and decided manner.

Finally, I will present without comment the following tables, designed to show at a glance the longitudinal, latitudinal, and temperature relations of pneumonia, as deduced from the statistics of 174 cities. The numbers inclosed in parentheses indicate the number of cities of which the numbers beneath show the average death-rate from pneumonia for each 1000 of population:—

Europe.

10°W.	5°W.	0°	5°E.	10°E.	15°E.	20°E.	25°E.	30°E.	Pnen. per 1000 inhab's. (aver.)	Mean annual temp. F. (aver.)	Latitude.
60°		(8)			(2)	(1)					
55		1.12			1.22	3.11			1.32	47.8°	
	(4)	(13)	(4)	(7)	(9)	(1)					
50	0.54	1.13	1.65	1.56	1.45	1.75			1.39	46.1°	
		(1)	(3)	(7)	(2)	(2)					
45		0.64	2.02	1.93	1.42	2.94			1.93	51.3°	
				(2)	(1)			(1)			
40				3.50	3.33			3.74	3.52	55.0°	
	0.54	1.11	1.81	1.97	1.55	2.68		3.74	Pnen.	Mean	
	52.1°	49.3°	51.6°	50.0°	48.2°	47.0°		49.0°	per 1000 inhab's. (aver.)	annual temp. F. (aver.)	

Longitude W. and E. from Greenwich.

North America.

	125°	120°	115°	110°	105°	100°	95°	90°	85°	80°	75°	70°	Pneu. per 1000 inhab's, (aver.)	Mean annual temp. F. (aver.)	Latitude.
50															
45												(1) 0.85	0.85	44.6°	
40				(1) 2.30	(1) 0.71		(1) 1.15	(3) 0.67	(5) 0.82	(7) 0.80	(9) 1.02	(37) 1.18	1.97	48.2	
35	(3) 1.21	(1) 2.61				(1) 0.34		(2) 1.71	(6) 1.24	(5) 1.02	(10) 1.36		1.29	55.0	
30		(1) 0.98					(1) 2.33	(2) 2.16	(4) 1.84	(1) 3.00	(1) 1.15		1.91	66.2	
25							(1) 0.94	(2) 1.43							
	1.21	1.80	2.30	0.71	0.34	1.47	1.40	1.26	1.05	1.20	1.17	1.27	69.2		
	57.1	57.5	52.0	47.5	49.3	61.9	57.9	56.1	52.1	52.6	48.0	Pneu. per 1000 inhab's, (aver.)	Mean annual temp. F. (aver.)		

Longitude W. from Greenwich.

Conclusions.—1st. The relations of pneumonia to altitude are definite and marked; with increase in elevation above the level of the sea, there is a steady diminution in the death-rate of pneumonia. To this rule some exceptions exist, but in the large majority of instances the relation holds good.

2d. The mean annual rain-fall of a place bears no positive relation to pneumonia; in some instances a large mortality from the disease coincides with a large precipitation of rain, in others with a small precipitation, while in as many others the contrary conditions are found to prevail.

3d. The higher the death-rate of a place from all causes, the greater the mortality from pneumonia. This rule is almost, if not actually, absolute.

4th. The larger the actual population of a locality, the greater its relative death-rate from pneumonia; the explanation for this being probably found in the following: Density of population bears an undoubted relation to the pneumonia-rate, increase in the former being followed by, or going hand-in-hand with, increase in the latter.

5th. There is a direct, positive, and unequivocal relation between the mean annual temperature of a place and its death-rate from pneumonia; the rule being that a high mortality from the disease coincides with a high mean annual temperature. Exceptions exist, but, being unusual and rather rare, their existence can hardly be considered to invalidate this rule.

6th. Proximity to large bodies of water, such as lakes, inland seas, or the ocean, exerts no appreciable influence on the pneumonia-rate.

7th. For North America, pneumonia increases in frequency as we pass from east to west; for Europe as we advance from west to east, the rate of increase being very nearly twice as great in the case of the latter as in that of the former.

8th. Pneumonia, all other things being equal, increases in frequency the further we advance from the polar regions towards the tropics; this, however, only up to a certain parallel, beyond which it seems to become less and less commonly met with, until at or near the equator, where it apparently disappears. As far as the latter part of this statement is concerned, such would seem to be the truth, judging by what few facts are at hand. Statistics for the equatorial regions are rare, and, even then, unreliable; hence I have purposely omitted to present them. So few, vague, and indefinite are they as to be almost valueless, allowing only of problematic deductions.

The foregoing conclusions apply more particularly to the Northern Hemisphere, all the statistics I have collected referring to places north of the equator; facts, save in a few instances, relating to places in the Southern Hemisphere being wanting.

ARTICLE VIII.

THE COMPARATIVE ACTION OF SULPHATE OF DATURIA AND OF SULPHATE OF HYOSCYAMIA UPON THE IRIS AND CILIARY MUSCLE.¹ By CHARLES A. OLIVER, M.D., of Philadelphia.

THE same rules² as in previous paper on the Comparative Action of Hydrobromate of Homatropine and of Sulphate of Atropia, have been strictly adhered to.

Observations.—1. The mydriasis of a single instillation of the one-fortieth of a grain of sulphate of datura was consummated in sixteen to eighteen minutes; whilst the mydriasis produced by a single instillation of the one-fortieth of a grain of sulphate of hyoscyamia took place in eight to ten minutes' time.

2. The mydriasis of a single instillation of the one-twentieth of a grain of sulphate of datura occurred in twelve minutes; whilst the mydriasis of a single instillation of the one-twentieth of a grain of sulphate of hyoscyamia took place in eight minutes' time.

¹ Second of a series of articles on the comparative action of the different mydriatics. The first being in the July, 1881, number of this Journal.

² For those who have not seen them, it may be important to repeat. Single instillations of the one-fortieth and the one-twentieth of a grain each, at intervals of one month. Young emmetropes chosen, a few having been previously corrected for H + Ah, in all of whom, the correcting glass and its distance from the eye were calculated for. Care taken to obtain persons of intelligence, and place them under the same conditions in reference to light and time of day. In every case, as soon as accommodation for Sn. 1½ became impossible, a convex lens was placed one-half inch before the eye—this in all instances being taken into account.

3. The utmost loss of accommodation occasioned by a single instillation of the one-fortieth of a grain of sulphate of daturia was attained in thirty-six minutes; whilst the utmost intensity of the action of a single instillation of the one-fortieth of a grain of sulphate of hyoscyamia took place in thirty minutes' time.

4. The utmost loss of accommodation occasioned by a single instillation of the one-twentieth of a grain of sulphate of daturia was attained in twenty-six minutes; whilst the utmost intensity of the action of a single instillation of the one-twentieth of a grain of sulphate of hyoscyamia took place in twenty minutes' time.

5. The single instillation of the one-fortieth or the one-twentieth of a grain each of both the sulphate of daturia and the sulphate of hyoscyamia produced full dilatation of the pupil.

6. Full ciliary paralysis was obtained in nearly every instance by the single instillation of the one-fortieth or the one-twentieth of a grain each, of both the sulphate of daturia and the sulphate of hyoscyamia. The intensity of action seeming to depend entirely upon the quality and degree of refraction, being greater in the normal emmetropic eye.

7. The dilatation of the pupil occasioned by the single instillation of the one-fortieth or the one-twentieth of a grain of sulphate of daturia, remained *ad maximum* for twenty-four to thirty-six hours; whilst that of equivalent amounts of sulphate of hyoscyamia remained intact for thirty-six to forty-eight hours. The time of the greater amount being longer in both instances.

8. The total ciliary paralysis occasioned by the single instillation of the one-fortieth or the one-twentieth of a grain of sulphate of daturia is maintained for twenty-four to thirty-six hours; whilst that of equivalent amounts of sulphate of hyoscyamia is stationary for thirty-six to forty-eight hours. The time of the greater amount being longer in both instances.

9. By accurate observations made many times daily, after the mydriasis and ciliary paralysis of the single instillation of the one-fortieth of a grain of sulphate of daturia were established, it was found that the pupil became normal in about fifteen days, and full accommodation returned in nine to ten days' time; whilst with the single instillation of an equivalent amount of sulphate of hyoscyamia, pupillary diameter became normal in about seventeen days, and full accommodation was regained in ten days' time.

10. By accurate observations made many times daily after the mydriasis and ciliary paralysis of the single instillation of the one-twentieth of a grain of sulphate of daturia were established, it was found that the diameter of the pupil became normal in about sixteen to seventeen days, and full accommodation was restored in ten days' time; whilst in the mydriasis and ciliary paralysis of the single instillation of the one-twentieth of a grain of sulphate of hyoscyamia, the pupil became normal in seven-

TABLE I.—Comparative action of the one-fortieth of a grain each.

Explanation.—The numbers under the line A, A' designate the number of minutes after instillation. The numbers from B to E, the ciliary power, expressed in dioptries. The numbers from A to E, the horizontal diameter of the pupil in millimetres. The dotted line the action of datura. The ruled line the action of hyoscyamia. The heavy dots the times of examinations.

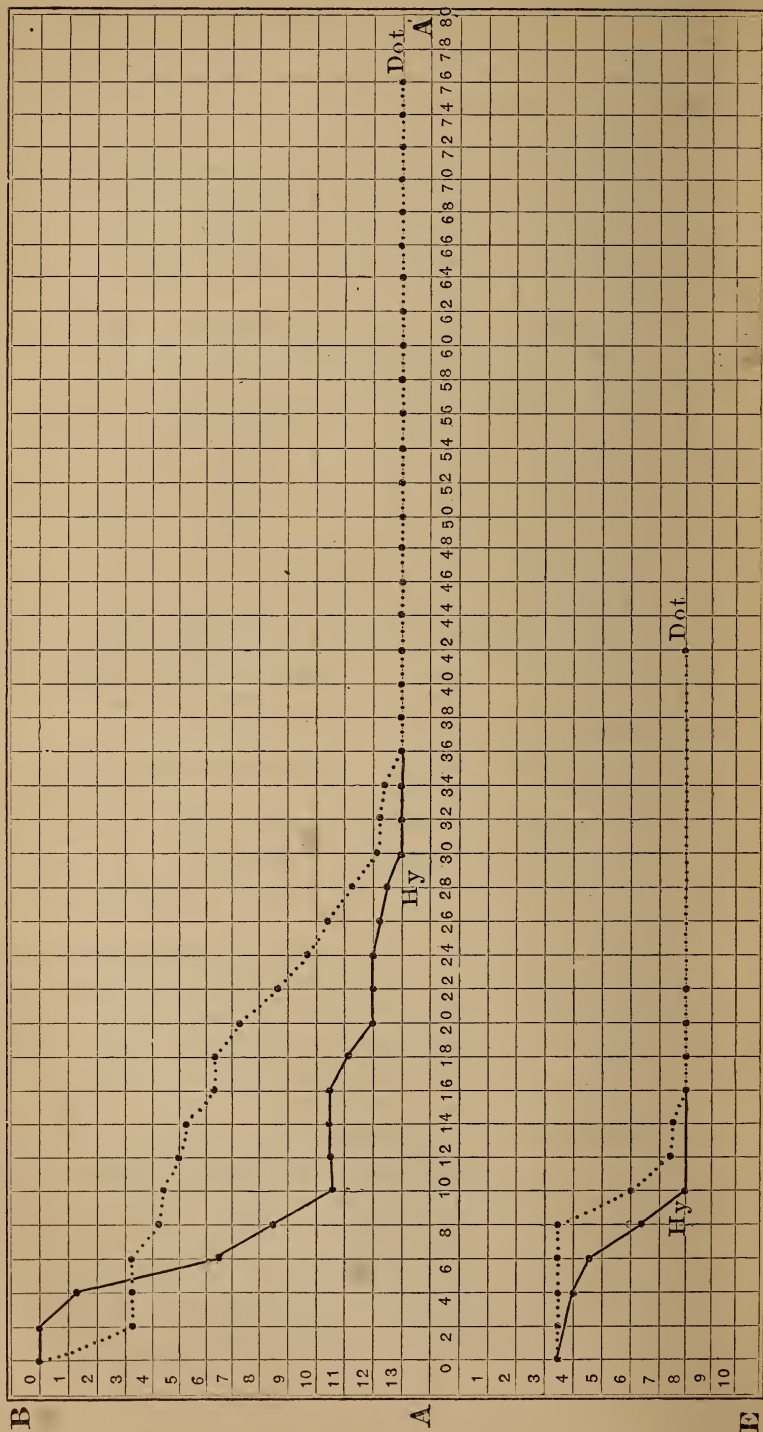
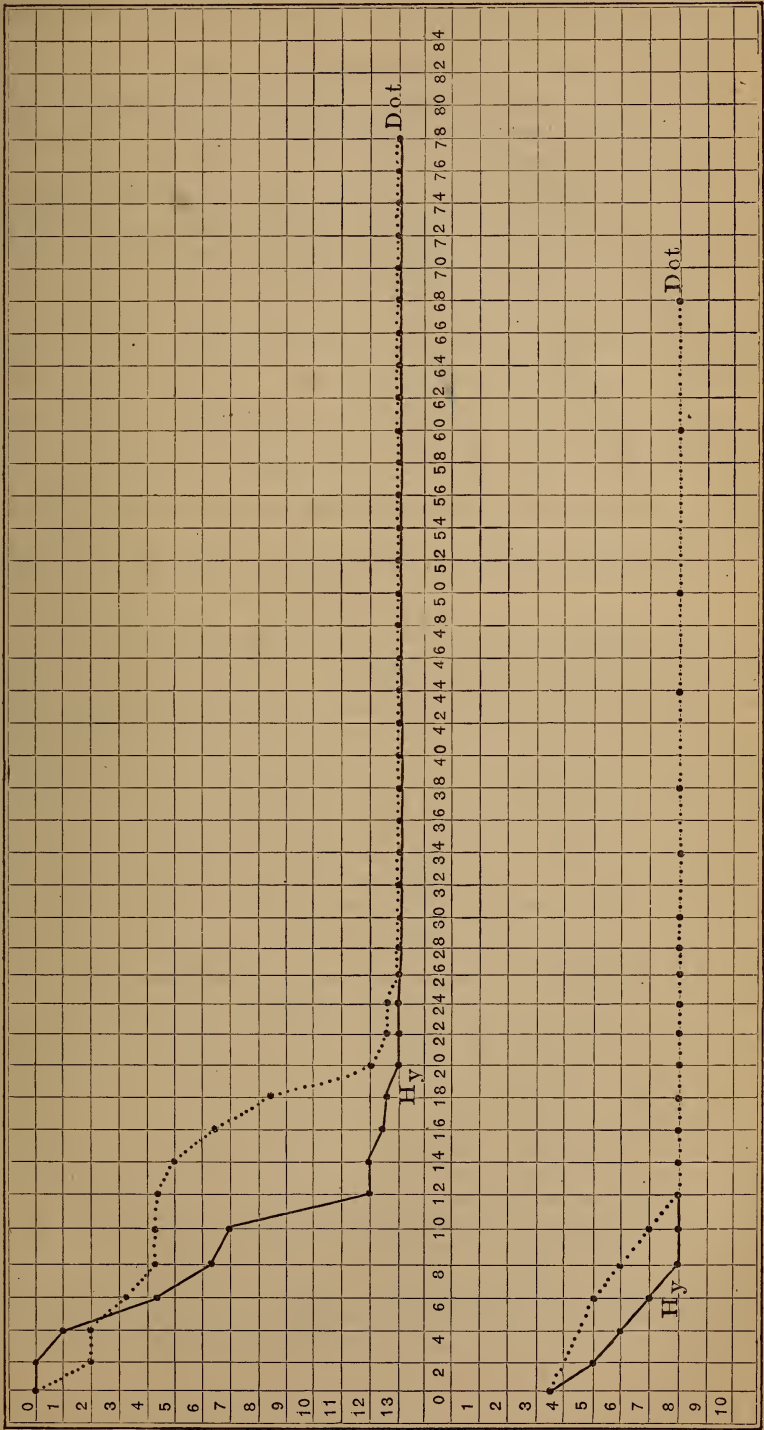


TABLE II.—Comparative action of the one-twentieth of a grain each.



teen days, and full re-establishment of the power of the ciliary muscle occurred in twelve days' time.

During the course of the experiments it was noticed—

1. With both drugs, a marked sense of conjunctival astringency, which in a few instances amounted to actual smarting and pain—this being more pronounced with daturia.¹

2. In a few instances, during the use of the daturia, there was some constitutional disturbance—faucial dryness and bitter taste, accompanied with flushing of the face, headache, and giddiness, but all of such a mild and exceedingly slight character as practically to be of no moment.²

3. In many instances, when the hyoscyamia was used, constitutional disturbance manifested itself by dry throat, flushed face, intense giddiness, wakefulness, followed by profound sleep.³

4. A case of H + Ah, corrected several months previously with the use of sulphate of atropia, chose the same combination, at intervals of one month, with the use of single instillations of the one-twentieth, one-fortieth, one-sixtieth, and the one-eightieth of a grain each of sulphate of daturia.

5. During the correction of several cases of H + Ah, with both the

¹ In every specimen there was acidity, as shown by the litmus test.

² The gravity and character of these symptoms were remarkable in being comparable with those of equivalent amounts of atropia.

³ It may be interesting to note a case of marked susceptibility to this drug. J. S. H., æt. 23 years, a strong, healthy, intelligent woman of firm character, had several times submitted her eyes to my use in these investigations, having had atropia, homatropine, and daturia instilled without the least constitutional effect. On two occasions the one-fortieth and the one-twentieth of a grain each of sulphate of hyoscyamia was instilled. One hour after the instillation of the one-twentieth of a grain, she complained of giddiness and vertigo, with inability to walk—this lasting for more than thirty minutes: saying that her "legs felt weak and head dizzy," during this time not having a particle of headache, although face flushed and temperature increased, accompanied with cardiac palpitation. Pulse 112 to the minute (her average pulse rate being 72 to 76). She had great difficulty in reaching her home, and then went immediately to sleep, awakening in four hours, so hoarse she could hardly speak. Went to bed, remaining awake and restless for six hours, and then fell into a profound sleep.

At the time of the instillation of the one-fortieth of a grain, she again complained (without any knowledge of the similarity of the drug) of faucial dryness, giddiness, wakefulness, followed by deep sleep. I here give an extract from a note mailed to me a few days later: "After instillation, my eyes gave me great inconvenience on account of their dull, heavy, leaden feeling; the dryness of lining membrane of nasal cavities and throat also affected me unpleasantly; had a great desire to sleep, but sleep acknowledged its unwillingness to comfort me, by changing my couch into a floating pillow of what evidently must have been hydrogen gas, so light it appeared. Sometimes this airy balloon-like bed would persist in turning in such a position that my head would drag, and the vain attempt which I made to assume a more comfortable 'pose,' seemed only to aggravate my torture, by straining my back and causing a peculiar feeling in my brain. Released from this misery, I fell into a rock-like sleep, from which it was difficult to arouse me. After arising, my legs were weak and head dizzy."

I await with much curiosity the action of duboisia upon this subject.

drugs, it was noticed that upon the patient's return in twenty-four hours after the primary instillation, full paralysis had occurred during the intervening time, and the correct combination chosen without the use of a second instillation; proving that through strain and irritation, the ciliary muscle had not been paralyzed at the proper time for a normal eye.

6. In many cases of $H + Ah$, in which latent hypermetropia was high, the astigmatism at a comparatively rare angle, accompanied with much retinal and choroidal disturbance, it was impossible to obtain complete paralysis of the ciliary muscle by single instillations of the amounts given.

7. Unreliability of results, dependent upon miscellaneous selection of drugs. During the first series of these experiments, in which it was found necessary to verify previous calculation in two normal eyes, different results were obtained from specimens obtained from other sources. Reliable articles were gotten, and care taken to prepare fresh solutions, and use new pipettes in every individual case.

Conclusions.—1. A single instillation of either the one-fortieth or the one-twentieth of a grain each of both the sulphate of daturia and the sulphate of hyoscyamia, is sufficient to paralyze accommodation in a normal emmetropic or a healthy ametropic eye.

2. No dependence can be placed upon the action of a single instillation of either the one-fortieth or the one-twentieth of a grain each, of both the sulphate of daturia and the sulphate of hyoscyamia, upon the ciliary muscle of an unhealthy ametropic eye.

3. A single instillation of either the one-fortieth or the one-twentieth of a grain each of both the sulphate of daturia and the sulphate of hyoscyamia, is of no value in the estimation of the degree of refraction in marked cases of asthenopic ametropia; but may be of great service in either verifying previous results or primarily determining errors in healthy ametropic eyes.

4. Maximum dilatation of the pupil is produced by a single instillation of either the one-fortieth or the one-twentieth of a grain each of both the sulphate of daturia and the sulphate of hyoscyamia.

5. The total paralysis¹ of the ciliary muscle, occasioned by a single instillation of either the one-fortieth or the one-twentieth of a grain of sulphate of daturia, is attained later and lost sooner than the total paralysis occasioned by a single instillation of equivalent amounts of sulphate of hyoscyamia.

6. The mydriasis of a single instillation of either the one-fortieth or the one-twentieth of a grain of sulphate of daturia is not so quickly attained,

¹ Complete paralysis is not necessarily meant. The use of the terms "total paralysis" and "full action" are synonymous, and imply the utmost action of the drug, which may be either complete or incomplete.

and is of shorter duration than that of a single instillation of equivalent amounts of sulphate of hyosecyamia.

7. The full action of a single instillation of either the one-fortieth or the one-twentieth of a grain of sulphate of daturia upon the iris and ciliary muscle, remains *intact* for a shorter time than that of a single instillation of equivalent amounts of sulphate of hyosecyamia; the time of the latter being almost double that of the former.

8. With the use of the amounts given of both the drugs, primary calculation of refractive error may be accurately obtained without second instillation, after the lapse of twenty-four hours.

9. The long-continued dilatation of the pupil and the slow return of ciliary power occasioned by the amounts given of both the drugs, render them absolutely useless where we desire accurate ophthalmoscopic examination in cases dependent upon their use.

10. The astringent and irritant action of the two drugs upon the conjunctiva may be avoided by the use of a neutral salt.

11. The comparatively rare and slight transient constitutional effect caused by a single instillation of the amounts given of sulphate of daturia may be considered as perfectly harmless, and of no consequence.¹

12. The grave constitutional disturbance sometimes seen during the use of a single instillation of the amounts given of sulphate of hyosecyamia, should render us cautious in its employment.

PHILADELPHIA, 1507 Locust Street.

ARTICLE IX.

A CASE OF OBSTRUCTION OF THE INFERIOR CANALICULUS OF THE EYE BY DACRYOLITHS. BY HENRY G. CORNWELL, M.D., of Columbus, Ohio, Clinical Lecturer on Ophthalmology and Otology, Starling Medical College, Columbus, Ohio.

J. P., æt. 46, Columbus, Ohio, came under the observation of the writer, March 20, 1882, complaining of an interference with the escape of the tears from the left eye, which had annoyed him for ten years. An examination revealed lachrymal conjunctivitis, the lachrymal punctum slightly everted, its orifice of normal size, and the walls of the canal somewhat thickened. No accumulation of tears in, or any evidence of inflammation of the lachrymal sac. Suspecting a stricture of the canaliculus, this passage was slit up by means of a delicate pair of scissors, one blade of the instrument passing readily through the canal without obstruction. On the following day on attempting to separate the edges of the incision, in order to prevent their union, by means of a Bowman probe held vertical, the instrument struck a gritty substance, which proved to be one of four

¹ During the progress of these experiments, the author has been forcibly struck with the similarity of the behaviour of atropia and daturia.

dacryoliths, which were arranged bead-like along the floor of the canal. The canal itself, after their removal, was found to be much enlarged as a result of this calcareous deposit.

The concretions were blackish-gray, and of irregular, grape-cluster-like form. They were placed in the hands of Mr. Curtis C. Howard, professor of chemistry in Starling Medical College, who subjected the smallest one to chemical analysis. The following is his report :—

“The dacryoliths were found to weigh as follows : .234, .163, .134, .090 grain. The last one contained : organic matter 28.3 per cent., inorganic matter 71.7 per cent. The inorganic matter was found to be chiefly, if not entirely, phosphate of lime ; the small quantity (.09 grain) preventing a complete examination for all acids and bases.”

Such concretions, formed by a deposit of the saline elements of the tears, are very rarely observed.¹ They have been found in the lachrymal gland, on the conjunctival surface of the upper lid,² in the ducts of the Meibomian glands, in the conjunctival *cul-de-sac*, in the lower canaliculus and lachrymal duct. The cause of their formation is not clearly understood. In some instances the deposit is due to a change in the physical properties of the fluid corresponding in character to that which brings about the formation of urinary, salivary, and biliary calculi. In other instances they appear to be due to the calcification of a fungus formation, occurring in connection with a chronic catarrhal inflammation of the lachrymal passages. They are not observed as a result of dacryocystitis, or complete obstructions of the lachrymal duct, due to strictures.—(*Mackenzie and others.*)

181 EAST STATE ST.

ARTICLE X.

AN ANALYTICAL EXAMINATION OF ONE HUNDRED CASES OF EXTIRPATION OF THE KIDNEY ; WITH A TABULAR RECORD ARRANGED CHRONOLOGICALLY. By ROBERT P. HARRIS, A. M., M. D., of Philadelphia.

THREE forms of operating upon the kidney are now designated by acknowledged and distinct titles, between which there should be no mistake either in the subjects of descriptive papers or the indices of journals. *Nephrotomy*, *nephrolithotomy*, and *nephrectomy* are sufficiently clear in

¹ Among 25,740 eye cases treated at the Brooklyn Eye and Ear Hospital during the last thirteen years, 2 cases having dacryoliths were observed (Thirteenth Annual Report of The Brooklyn Eye and Ear Hospital, Jan. 1882).

² Two years ago a case, the patient a girl, came under the writer's care, in which there were found four or five small chalky concretions on the palpebral conjunctiva of one eye, which could only be removed with a knife. They produced effervescence when dropped into dilute mineral acid.

their derivations to explain their own meaning. We have in this article to deal with the last of the three, which is not infrequently preceded by the first or second, in the hope that the removal of the organ may be avoided.

We may also divide the cases of nephrectomy, as shown by the table appended, into *anticipated* and *non-anticipated*. In the early days of the operation, it will be noticed, that the operator was nearly always at fault in his diagnosis, and did not discover the true nature of the abdominal tumour to be removed, until his introduced hand recognized its lumbar attachments. Thus a hydronephrosis was usually taken for an ovarian cyst; and a solid renal tumour for one of the liver or spleen. Where a cyst was tapped, the character of its fluid contents aided to determine its renal origin; but where this was not done, the surgeon was often not aware of the nature of the case, until already engaged in operating upon it.

The advances that have been made in the differential diagnosis of abdominal tumours, and especially through the introduction of *aspiration* by Dieulafoy, have diminished the proportion of errors, and enabled the operator, by the microscope and chemical tests, to detect the existence of renal cystic fluids; but where solid tumours exist, there will always be more or less uncertainty, unless the character of the urine, early pains experienced, and history of the first detection of the growth, are such as to lead to a correct diagnosis. Unfortunately, the dangers of aspiration, even when capillary, are such that it is often unsafe to use it as a means of early diagnosis, and must be followed as soon as possible by the removal of the cyst under examination. It is far from safe to aspirate even an ovarian cyst a few days before an intended ovariectomy, and from the nature of the growth and its contents, it is much more dangerous to do the same to a hydronephrosis containing urea, and often purulent fluid mixed with the urine.

To the late Gustav Simon, of Heidelberg, must be given the credit of having performed the first *anticipated* nephrectomy, and also for initiating the lumbar method of operating. Fortunately for humanity and the reputation of the operator, his case recovered, for had he failed, he would not only have been censured for attempting to cure a urethral fistula by the removal of a sound kidney; but the future of the operation, as more legitimately demanded, would have been decidedly darkened, and its present reputation achieved at a much later period. As it was, the first years of the operation were very discouraging, compared with the results more recently recorded; for of the first twelve cases, covering a period of as many years, but two recovered.

Although nephrectomy may be said to have legitimately commenced with Simon, his was the fourth operation, two of which were in this country, in which a kidney was extirpated; those preceding him having acted under a misconception of what was required to be done in their

respective cases. After the result of Simon's case became known, great efforts were made to find some historical record of a prior operation conceived and accomplished as his had been; but no evidence has been produced, and he, therefore, stands alone in the honour. It was long known to the medical world, that a human being, or one of the lower animals, might live in health with only one kidney, as shown by autopsies, and the experiments of vivisectioners; but it was not until 1869 that this fact was established in the case of a living woman, under the knife of a surgeon.

In the year 1873, twelve years after the first nephrectomy, the tide of results changed for the better, and after a succession of six recoveries the operation came to be regarded with greater favour; and since that time has been more and more abundantly performed in each successive year, until now, of the abdominal operations it is, perhaps, only second in frequency to oöphorectomy, as instituted by Battey, of Georgia, especially in Germany and England. As an operation of interest, it takes rank above that of extirpation of the uterus for cancer, as its cures are in the majority of instances of a more permanent character, the kidney being subject to forms of disease of which malignancy is only an occasional element. To remove a cancerous uterus so as to achieve a favourable result, requires great care and skill on the part of the operator; but the probability of a return of the disease with fatal effect, limits very much the satisfaction of success. It is true that the kidneys are liable to be both attacked with the same disease, and this is especially the case with tuberculosis and calculus; but it is astonishing how frequently calculi are found only on one side, although in all probability formed from the same diathesis in both, but detained only in one by its smaller-sized ureter. The "wandering" or floating kidney, so common among the women of Germany, appears to be a fruitful cause of renal suffering, and has in a number of instances been removed, especially by A. Martin, of Berlin. This condition is found to affect mainly the right kidney of women who have borne children, and has been attributed by some to the pregnant state, and by others to the wearing of tight compressing strings and bands around the waist to secure the clothing. Dr. Oser, of Vienna, is given as authority for the opinion, that one woman in ten who have borne children, among the poor of Austria, has a right movable kidney, which he claims results from the ascent of the uterus loosening its peritoneal attachments. It has been asserted that this condition is congenital, and not acquired; but there is strong ground for the belief that it is due to a gradual elongation of the attachments of the kidney, which possibly may be congenitally relaxed, as a commencement of the prolapsus. A movable kidney may be only a little less fixed than one normally secured, and is not likely to become painful unless it should be gradually drawn into the floating condition, when it may become so by disease, or mechanical obstruction to the escape of urine.

Table of 100 Operations.

No.	Date.	Operator.	Locality.	Sex	Age	Seat of incision.	Diseased condition of the subject operated upon.	Died.	Recovered
1	June 4, 1861	E. B. Wolcott	Milwaukee, U. S.	M.	58	Abdomen	Encephaloid kidney. Diagnosed a cyst of the liver.	D.	
2	June 23, 1867	Spiegelberg	Breslau	F.	42	A.	Hydatid cyst of kidney. Diagnosed an ovarian cyst. <i>Removal incomplete.</i>	D.	
3	April, 1868	Peaslee	New York	F.	..	A.	Solid renal tumour. Diagnosed an ovarian growth	D.	
4	April 2, 1869	Simon	Heidelberg	F.	46	Loin	Fistula of ureter produced in an ovaro-hysterectomy; kidney not diseased.	..	R.
5	Nov. 15, 1869	Esmarch	Kiel, Ger.	F.	19	A.	Large cyst of kidney, with pelvic adhesions; diagnosed ovarian.	D.	
6	?	Reported by S. Wells	London	F.	..	A.	Fibro-cystic tumour of uterus, with an adherent normal kidney.	D.	
7	Dec. 1870	Gilmore	Mobile, U. S.	F.	39	L.	Painful movable shrunken fibrous kidney; woman 5 months pregnant, and went to full term.	..	R.
8	Mar. 23, 1871	Von Brüns	Wurtemberg	M.	..	L.	Gunshot wound of kidney converting the organ into a large abscess.	D.	
9	June, 1871	Meadows	London	F.	..	A.	Large cyst of kidney. Diagnosed ovarian.	D.	
10	Aug. 8, 1871	Simon	Heidelberg	F.	30	L.	Small fibrous kidney containing blood-clots. Diagnosis, calculous pyelitis.	D.	
11	May 14, 1872	Durham	London	F.	43	L.	Painful kidney; organ appeared healthy; nephrotomy had failed to give relief.	D.	
12	May 16, 1872	G. A. Peters	New York	M.	36	L.	Tuberculous kidney. Diagnosis, calculous pyelitis; other kidney found diseased on autopsy.	D.	
13	Jan. 7, 1873	Brandt	Klausenberg Austria	M.	23	L.	Extrusion of kidney through a knife-wound in the loin.	..	R.
14	Dec. 2, 1873	Campbell	Dundee, Scotland	F.	49	A.	Cyst, involving lower third of kidney; presumed ovarian.	..	R.
15	Apr. 14, 1875	Le Dentu	Paris	M.	42	L.	Hydronephrosis and perinephritic abscess	..	R.
16	1875	Marvaud	Algiers	F.	y'ng	L.	Extrusion of kidney through a wound with a yatacan.	..	R.
17	Dec. 7, 1875	Langenbuch	Berlin	F.	32	L.	Sarcoma of kidney.(?) Organ of a sack-form; not examined microscopically.	..	R.
18	?	Langenbuch	Berlin	M.	20	A.	Painful floating kidney.	..	R.
19	Apr. 20, 1876	Kocher	Bern	F.	35	A.	Sarcomatous floating kidney. Colon and contiguous parts involved. <i>Removal incomplete.</i>	D.	
20	July 4, 1876	Hüter	Greifswald, Germany	F.	4	A.	Sarcoma of left kidney; weight nearly 5 pounds. Presumed a splenic or ovarian growth.	D.	
21	July 18, 1876	Billroth	Vienna	F.	46	A.	Hydronephrosis. Presumed an ovarian cyst.	D.	
22	?	Hamilton	China	M.	..	L.	Extrusion of kidney through a knife-wound.	..	R.
23	Jan. 7, 1877	Jessop	Leeds, Eng.	M.	2½	L.	Encephaloid kidney; died of a return of the disease in nine months.	..	R.
24	Jan. 28, 1877	Heath	London	F.	24	A.	Calculous hydronephrosis; presumed to be ovarian.	D.	
25	Aug. 6, 1877	Dumreicher	Vienna	M.	33	L.	Sacculated and dilated kidney; diagnosed a calculous pyelitis.	D.	

No.	Date.	Operator.	Locality.	Sex	Age	Seat of incision.	Diseased condition of the subject operated upon.	Died.	Recovered
26	Sept. 27, 1877	Koehler	Bern	M.	2½	Abd'm	Adeno-sarcoma of kidney.	D.	
27	Feb. 18, 1878	Müller	Oldenburg, Germany	M.	21	Loin	Calculous hydronephrosis	..	R.
28	Mar. 14, 1878	Byford	Chicago, U. S.	F.	39	A.	Encephaloid kidney; 4½ pounds.	..	R.
29	Mar. 15, 1878	A. Martin	Berlin	F.	49	A.	Painful floating kidney; found healthy in appearance.	..	R.
30	Aug. 15, 1878	A. Martin	Berlin	F.	30	A.	Painful floating kidney; no appearance of disease	..	R.
31	Nov. 14, 1878	A. Martin	Berlin	F.	25	A.	Painful floating kidney.	..	R.
32	Dec. 9, 1878	A. Martin	Berlin	F.	53	A.	Sarcoma of kidney, 28 oz.	..	R.
33	Jan. 9, 1879	Zweifel	Erlangen	F.	29	L.	Uretro-uterine fistula, after labour, with atrophy of the kidney.	..	R.
34	Jan. 19, 1879	Czerny	Heidelberg	M.	59	A.	Malignant tumour of kidney. Aorta ligated to arrest hemorrhage.	D.	
35	April 1, 1879	Billroth	Vienna	F.	35	A.	Retro-peritoneal myofibroma with a sound kidney attached. Presumed to be an ovarian cyst.	D.	
36	April, 1879	Urbinati	Cesena, Italy	F.	56	L.	Calculous pyelitis.	D.	
37	Apr. 19, 1879	A. Maria	Berlin	F.	48	A.	Painful floating kidney.	D.	
38	May 22, 1879	Czerny	Heidelberg	F.	32	L.	Fistula and pyonephritic abscess.	..	R.
39	June 23, 1879	A. W. Smyth	New Orleans U. S.	F.	35	L.	Painful floating kidney.	..	R.
40	June 24, 1879	A. Martin	Berlin	F.	24	A.	Painful floating kidney	D.	
41	July 17, 1879	E. Martini	Hamburg	F.	37	A.	Painful floating kidney.	..	R.
42	Aug. 11, 1879	Lossen	Heidelberg	F.	37	A.	Angio-sarcoma attached to a sound movable kidney; woman pregnant; aborted in 12 hours.	..	R.
43	Oct. 6, 1879	Czerny	Heidelberg	F.	37	A.	Hydronephrosis.	..	R.
44	Oct. 24, 1879	Merkel	Nürnberg	F.	28	A.	Painful floating kidney, affected with fatty degeneration.	D.	
45	Nov. 4, 1879	Bardenheuer	Cologne	F.	46	L.	Pyonephrosis and fistula.	..	R.
46	Nov. 23, 1879	Bardenheuer	Cologne	F.	22	L.	Pyonephrosis and abscess	D.	
47	Dec. 23, 1879	A. E. Barker	London	F.	21	A.	Encephaloid floating kidney.	D.	
48	Jan. 3, 1880	Thornton	London	F.	7	A.	Hydronephrosis of left kidney.	..	R.
49	Jan. 16, 1880	Savage	London	F.	56	A.	Hydronephrosis.	..	R.
50	Feb. 17, 1880	Lucas	London	M.	36	L.	Pyonephrosis, with lumbar fistula.	..	R.
51	Mar. 9, 1880	Czerny	Heidelberg	M.	23	L.	Hydronephrosis with sarcoma.	D.	
52	Apr. 3, 1880	Czerny	Heidelberg	F.	27	L.	Uretro-vaginal fistula of right side; kidney not diseased.	..	R.
53	Apr. 24, 1880	Couper	London	F.	y'ng	L.	Saccular and dilated kidney containing fetid pus.	..	R.
54	May 3, 1880	Czerny	Heidelberg	F.	40	A.	Hydronephrosis of right kidney; lived 48 days.	D.	
55	May 15, 1880	Czerny	Heidelberg	F.	23	L.	Calculi in left kidney; pelvis dilated.	..	R.
56	May 19, 1880	Credé	Dresden	F.	26	L.	Uretro-uterine fistula.	..	R.
57	May 20, 1880	Le Forte	Paris	M.	23	L.	Lumbar renal fistula; kidney very slightly altered	D.	
58	May 24, 1880	F. Lange	New York	F.	47	L.	Cystic kidney containing concretions; other kidney found useless on autopsy.	D.	
59	May 29, 1880	Spiegelberg	Breslau	F.	27	A.	Enlarged kidney, not apparently altered in structure. Diagnosed a hydronephrosis.	..	R.
60	July, 1880	Raffa	Rovigo, Italy	F.	20	L.	Suppurative nephritis, with purulent infection and tuberculosis. Lived four months.	..	R.
61	July 5, 1880	A. E. Barker	London	F.	32	L.	Calculous pyonephrosis.	D.	
62	July 20, 1880	A. Martin	Berlin	F.	..	A.	Painful floating kidney.	D.	
63	Aug. 2, 1880	Czerny	Heidelberg	F.	11 mo.	A.	Large adenoma of left kidney.	D.	

No.	Date.	Operator.	Locality.	Sex	Age	Seat of incision.	Diseased condition of the subject operated upon.	Died.	Recovered.
64	Aug. 19, 1880	J. H. McClelland	Pittsburg, U. S.	F.	20	Loin	Calculus pyo-hydronephrosis, with fistula in lumbar and inguinal regions.	..	R.
65	Oct. 3, 1880	Bardenheuer	Cologne	F.	48	L.	Cancer of uterus, involving the left ureter.	D.	
66	Oct. 5, 1880	A. E. Barker	London	F.	38	L.	Calculus pyonephrosis.	D.	
67	Nov. 28, 1880	A. Martin	Berlin	F.	..	Abd'm	Painful floating kidney.	..	R.
68	1880	Langenbuch	Berlin	F.	30	A.	Painful floating kidney.	..	R.
69	?	Bardenheuer	Cologne	..	5	L.	Pyonephrosis.	..	R.
70	Jan. 10, 1881	Czerny	Heidelberg	F.	35	L.	Pyonephrosis of right kidney.	..	R.
71	Jan. 30, 1881	Clementi	Catania, Italy	F.	28	L.	Pyonephrosis of left kidney.	..	R.
72	Feb. 22, 1881	W. M. Baker	London	F.	7	L.	Tuberculosis of kidney, 2½ oz.	..	R.
73	Feb. 22, 1881	Stockwell	Bath, Eng.	M.	54	L.	Sacculated and enlarged kidney. 10 oz.	D.	
74	Apr. 23, 1881	Czerny	Heidelberg	M.	51	L.	Angio-sarcoma of left kidney.	..	R.
75	?	Barwell	London	F.	16	L.	Pyonephrosis.	D.	
76	May 5, 1881	Barwell	London	M.	18	L.	Calculus pyelitis and retroperitoneal abscess.	..	R.
77	May 7, 1881	Czerny	Heidelberg	F.	45	A.	Sarcoma of lower part of left kidney.	D.	
78	?	Bardenheuer	Cologne	..	..	L.	Hæmaturia and renal colic.	..	(?) ¹
79	?	Bardenheuer	Cologne	M.	20	L.	Renal calculus and pyonephritic abscess.	..	(?) ¹
80	?	Bardenheuer	Cologne	M.	26	L.	Sarcoma of kidney.	..	(?) ¹
81	June 17, 1881	Czerny	Heidelberg	M.	52	L.	Calculus hydronephrosis	D.	
82	July 14, 1881	Godlee	London	F.	57	A.	Calculus pyelitis.	D.	
83	July 24, 1881	Rosenbach	Göttingen	M.	42	A.	Calculus pyelitis.	..	R.
84	July 25, 1881	Czerny	Heidelberg	M.	40	L.	Sarcoma of left kidney.	..	(?) ¹
85	Aug. 2, 1881	F. A. Kehrer	Heidelberg	F.	32	A.	Hydronephrosis.	..	R.
86	Aug. 3, 1881	Starck	Danzig	F.	42	L.	Wound of ureter in removing cancer of the uterus; nephrectomy 6 days later	..	R.
87	Sept. 5, 1881	Whitehead	Manchester	M.	46	A.	Solid tumour of left kidney 1 lb. 4 oz.	D.	
88	Sept. 10, 1881	Hieguet	Liege, Belg.	F.	6	A.	Sarcoma of kidney.	..	R.
89	Oct. 15, 1881	T. G. Thomas	New York	F.	21	A.	Fibro-cyst involving kidney.	..	R.
90	Oct. 23, 1881	G. Lepold	Leipsig	F.	23	A.	Blood-cyst of lower part of left kidney.	..	R.
91	Nov. 1881	Fratina	Ponderone, I.	F.	28	L.	Pyonephrosis of left kidney.	D.	
92	Nov. 1881	O. O. Burgess	San Francisco	M.	53	A.	Large cystic tumour of kidney.	D.	
93	Dec. 1881	H. Marsh	London	M.	35	L.	Cystic kidney. <i>Removal incomplete.</i> Other kidney found sound, on autopsy.	D.	
94	?	Lücke	Germany	M.	60	..	Carcinoma of kidney; other kidney contracted and cystic.	D.	
95	?	Baum	Danzig	F.	..	..	Hydronephrosis of left kidney.	D.	
96	?	Golding Bird	London	M.	young	L.	Tuberculosis of kidney.	D.	
97	?	Heywood Smith	London	..	..	A.	Hydronephrosis.	(?)	
98	Mar. 10, 1882	James Adams	London	M.	..	L.	Medullary sarcoma with hæmaturia, presumed a calculus pyelitis	(?)	
99	Mar. 11, 1882	Thornton	London	F.	..	A.	Pyonephrosis of right kidney.	..	R.
100	Mar. 15, 1882	Thornton	London	..	..	A.	Cystic, suppurating kidney, 4 lbs. 7 oz.	..	R.

¹ These have generally been credited in the column of *recoveries*, although I cannot find any record to that effect.

Causes of Death in 45 Cases.

No.	Operator.	Cause of death.	No.	Operator.	Cause of death.
1	Wolcott	Exhaustion in 15 days from profuse purulent discharge	54	Czerny	Pyæmia without peritonitis; abscesses in parotid, over the sacrum, and in the lungs; died in 45 days.
2	Spiegelberg	? in 26 hours.			Parotitis in 2d week.
3	Peaslee	Peritonitis, in 50 hours.	57	Le Fort	Pain and vomiting in 50 hrs.
5	Esmarch	Infarction of lungs in 36 hrs.	58	Lange	Anuria; both kidneys diseased.
6	Per S. Wells	? on the 3d day.	61	Barker	Shock in 3 hours.
8	Von Brüns	Shock, in 10 hours; other kidney diseased.	62	Martin	Chronic peritonitis, in 6 weeks.
9	Meadows	Hæmorrhage from the pedicle, on the 6th day.	63	Czerny	Septic peritonitis, in 3 days.
10	Simon	Pyæmia, in 31 days; appeared the 21st day.	65	Bardeheuer	Collapse, on 2d day.
11	Durham	? on the 7th day.	66	Barker	Shock, in 12 hours.
12	Peters	Exhaustion, in 65 hours; no peritonitis or uræmia.	73	Stockwell	Secondary hæmorrhage, 10 hours after operation.
19	Kocher	Peritonitis on the 3d day.	75	Barwell	Uræmia, on the 5th day.
20	Hüter	Hæmorrhage, under the operation, from the renal vessels.	77	Czerny	Hæmorrhage from renal vein
21	Billroth	Peritonitis, on the 2d day.	81	Czerny	Anuria, in 37 hours; other kidney atrophied.
24	Heath	Peritonitis, on the 6th day.	82	Godlee	Shock and anuria in 24 hrs.; other kidney healthy.
25	Dumreicher	Collapse, next day; chest opened in resection of rib.	87	Whitehead	Shock, exhaustion, and slight peritonitis on 4th day.
26	Kocher	Septic peritonitis, on 3d day	91	Frattina	Constant vomiting, from 23d to 31st day.
34	Czerny	Shock, after hæmorrhage, in 10 hours.	92	Burgess	Shock, in 30 hours.
35	Billroth	Septic peritonitis, in 5 days.	93	Marsh	Anuria in 30 hours; other kidney of healthy appearance.
36	Urbinati	Peritonitis on the 3d day.	94	Lücke	Uræmia in 4 days; other kidney contracted and cystic.
37	Martin	Peritonitis, in 3 days.	95	Baum	Peritonitis in 2 days.
40	Martin	Septic peritonitis.	100	G. Bird	Collapse.
44	Merkel	Uræmia, in 5 days.			
45	Bardenheuer	Septicæmia, in 10 days.			
47	Barker	Pulmonary embolism in 45 hours.			
51	Czerny	Collapse, in half an hour.			

N. B.—The numbers correspond with those of the cases in the preceding table.

Of floating kidneys there have been 16 removed by nephrectomy, with 10 recoveries. Of the 6 fatal cases, 1 was affected with sarcoma of the removed organ, 1 with encephaloid, and 1 with fatty degeneration. There was malignancy in but one of the recovered cases. Martin, of Berlin, performed one-half of the operations, saving 5 of the 8 cases. Fifteen of the subjects were women and 1 was a man, who was of the 10 saved. Two operations were by the lumbar incision, both saved; and 14 by the abdominal, 8 saved.

In 18 cases the kidney was either affected with malignant disease (17), or intimately adherent to a growth of this nature (1). These are recorded as *encephaloid*, 4; *sarcoma*, 10; *angio-sarcoma*, 2; *carcinoma*, 1; and simply *malignant*, 1. Of these cases 9 are reported as having died, and 6 recovered; the other three were under treatment when last heard from.

Of other prominent diseased conditions calling for the operation we find the following, viz.: Large cysts of the kidney, 4 died, 1 recovered; hydronephroses, 4 died, 4 recovered; calculous hydronephroses, 2 died, and 2 recovered; hydronephrosis with sarcoma, 1 died; pyonephrosis, 3 died, and 6 recovered; calculous pyonephrosis, 2 died; calculous pyelitis, 3

died, and 1 recovered; uretral fistulæ, 1 died, and 6 recovered; and tuberculosis, 2 died, and 2 recovered.

In 96 cases in which the site of incision is recorded, we find 46 abdominal and 50 lumbar operations. Of the former, 23 died, and 23 recovered; and of the latter 19 died, 27 recovered, and 4 are yet to hear from.

Of 62 women operated upon, 28 died, and 34 recovered; of 27 men, 14 died, 9 recovered, and 4 are still to hear from; and of 8 children, 3 died, and 5 recovered.

Of the 100 cases operated upon, 45 have died, 49 have recovered, and 6 were still under treatment when last heard from; these last include cases 78, 79, 80, and 84 of the record of 1881, as given by Prof. Czerny, of Heidelberg, before the International Medical Congress in London. From this record of Czerny, and the more recent one of Mariotti, of Italy, must be excluded the operation credited to "*Mynter*," whose nationality is not given. Upon tracing up this matter by correspondence, I find that the case is one of nephrotomy, and belongs to the well-known surgeon of Buffalo, Dr. Herman Mynter. It was his intention to have removed the kidney, but this was found impracticable by reason of intimate connections with the surrounding parts. After the woman's death, which was from pneumonia on the twentieth day, the kidney was found densely adherent, not only to the tissues around, but to have formed adhesions with the colon and pancreas. The case was one of calculus of the kidney, which produced a pyelitis, a pyelo-nephritis, abscess of the kidney, and perinephritis with adhesions. After death a large abscess was found in the top of the gland.

The one hundred operations are credited to the different countries in which they have been performed, as follows, viz.: to Germany, 50—28 recoveries, 18 deaths, and 4 to hear from as to the final result; England, 24—9 recoveries, 13 deaths, and 2 recent cases to hear from; United States, 10—5 recoveries, and 5 deaths; Austria, 4 deaths; Italy, 2 recoveries, and 2 deaths; Switzerland, 2 deaths; France, 1 recovery, and 1 death; Belgium, 1 recovery; Scotland, 1 recovery; Algiers, 1 recovery, under a French surgeon; and China, 1 recovery under an American. Of these, London has the credit of 21 operations; Heidelberg, 17; Berlin, 11; and Cologne, 7; which collectively (56), is probably about one-half of the cases up to the present time.

Nephrectomy may be safely claimed to save at least one-half of the cases operated upon. The statistics show a higher rate of cure than this; but we must make allowance for unreported cases, of which it is probable there are very few, except what belong to the past year. It has been satisfactorily demonstrated, that a woman or man may spare one kidney without impairment of health, provided the one left is perfectly sound; it has also been shown that life may be materially prolonged after the extirpation of a cancerous or other malignant degeneration of a kidney, if alone affected; and it has been proved, that tuberculosis of one kidney is apt to

be followed sooner or later by the same disease in the other. The true value of the operation can only be estimated when we have a record of the subsequent health of the patients, and time, cause, and manner of death.

The relative value and safety of the abdominal and lumbar methods of operating, cannot be ascertained from their respective results, as shown in the table. Theoretically, the lumbar incision ought to be the safer, but much will depend upon the character of the case to be operated upon, and practicability often decides the question in favour of the abdominal incision. Where the kidney is but slightly enlarged, the costo-iliac space sufficient, and the gland moderately adherent, there can be no question that the lumbar method is safer and preferable; but in a large proportion of cases the abdominal section is the easier and safer of the two, by reason of the size and character of the tumour, and the difficulties to be overcome in ligating its bloodvessels. Believing that the post-peritoneal method is only theoretically safer, Dr. Knowsley Thornton, after the direction of Langenbuch, advocates the abdominal incision in almost all cases; making his opening in the *linea semilunaris*, on the side corresponding to the kidney to be removed. He believes that this method is the truly scientific one for nephrectomies in general, and offers great advantages in ligating the bloodvessels and turning out the diseased kidney, thus avoiding the dangers of hemorrhage.

The causes of death may be enumerated as follows, viz. :—

Peritonitis	8	Secondary do.	1	Collapse	4
Septic peritonitis	4	Uræmia	6	Exhaustion	2
Septicæmia	1	Pulmonary embolus	2	Excessive vomiting	2
Pyæmia	2	Shock	7	Not stated	3
Hemorrhage	3				

Special Cases.—No. 7 was the first operation, in my tabular record, in which a diseased kidney was removed, under a correct diagnosis, and with a favourable result. The woman had been long suffering with a painful floating kidney, and an attempt had been made by another operator to excite adhesive inflammation by means of a seton, and thus fix the kidney in contact with the abdominal wall. But the tape cut its way out of the kidney, leaving a cicatrix two inches long, and set it once more at liberty. This case was also one of two, in which the operation was undertaken during pregnancy, and without exciting abortion. In the other case (42) abortion followed in twelve hours.

Cases 13, 16, and 22 were all instances of protrusion of the kidney through incised wounds of the loin; in an Austrian, an Algerine woman, and a Chinaman. From the repetition of this peculiar injury within quite a limited period, we are led to infer that such wounds have not been uncommon in past ages. From the report of the case of the Chinaman we may also infer, that such injuries were capable of spontaneous cure, the vessels of the kidney being closed by the cicatrization of the lumbar wound, and the pedicle cut off by strangulation and death.

Case 64 presented the rare complication of two fistulæ, a primary one in the loin, and a secondary one in the groin, on the left side. Pain in the corresponding kidney had existed twelve years at intervals, or from the age of 8. The lumbar sinus formed four years before the operation, and gave exit to a calculus four months later; and a week before the operation a second abscess pointed in the groin, was opened, and established a second fistula, giving exit to pus and urine. The excretory function of the kidney continuing in activity, the offensive state of the woman can well be imagined, and the immediate relief appreciated. The measure of urine voided by the urethra soon doubled.

Case 90 is unique in the history of nephrectomies; as a large cyst involving the lower part of the kidney and pendent from it was found to contain blood, the origin of which could not be accounted for, as there was no aneurism or open vessel.

From the record of cases given, and their numerous mishaps, it is evident that the operation of nephrectomy is still upon trial, both as to the best method of performance, and the diseased conditions indicating the excision. With regard to some of the diseases of the kidney, we may say without hesitation, that the operation is demanded, and promises well, both as to the prospect of recovery, and the permanence of relief obtained. But there are other conditions, in which operations have been performed, under circumstances of very doubtful utility. We are not prepared by evidence of final results, to recommend the operation in cases of renal sarcoma of children, where at best the temporary relief is but a poor return for the risk, suffering, and perhaps parental anxiety in the case. The same opinion in a modified form will hold good with regard to tuberculosis, which if primary in one kidney, is not likely to remain long confined to it, or to be eradicated by its removal. Of four cases, two recovered, and one of these survived four months; the fate of the last one, a girl of seven years of age, will be of some interest. She was operated upon fifteen months ago. In cancerous and scrofulous subjects there is but little hope of being able to prolong life beyond a limited period. In hydronephrosis; pyonephrosis; calculous pyelitis, with or without fistula; and painful floating kidney, there may be entertained strong hopes of final success.

In my tabular record I have added 27 cases, to that of Prof. Czerny, prepared ten months ago; his last operation bearing the date of July 25, 1881. As this in my record is case 84, he was eleven short of the full list, and I presume I must be fully that now. I have also added 22 to the record of Mariotti, whose paper appeared in *Lo Sperimentale* of February and March, 1881. When Credé published his own operation, he numbered it the 42d; but it will now be seen that it was, at the lowest, the 56th. For these reasons I have not given my record as "*the first hundred*," as this will not be reliably ascertained for a year yet.

ARTICLE XI.

VALUE OF CARDIO-SPHYGMOGRAPHY FOR THE DETERMINATION OF CARDIAC VALVULAR CONDITIONS AND OF ANEURISM, PARTICULARLY FOR EXAMINERS IN LIFE INSURANCE. By A. B. ISHAM, M.D., of Cincinnati, Ohio.

THE graphic method in diseases of the circulatory apparatus has, within the past few years, made such positive additions to our means of arriving at certain conclusions in regard to valvular affections of the heart and calibre changes in the principal arterial vessels, that no physician, who has to deal with such conditions, should content himself to rest in ignorance of the method and its results. It is of particular importance that examiners in life insurance should know what cardio-sphygmography has accomplished, and should be competent to avail themselves of the advantages which it offers in clearing up doubtful cardiac physical signs. They occupy a position of peculiar responsibility, both toward the company by which they are engaged and toward the general public. It is their duty to the former to recommend only clean risks, about which there hangs nothing to stand in relation to a future fatal disease. Therefore, in a person presenting with cardiac murmur, they cannot upon physical signs, and objective signs, and applicant's history, predicate a positive opinion that an existing murmur is purely functional without significance as regards the structural integrity of the organ, and it is manifestly obligatory upon them to class the risk as doubtful. In doing this, while the company may be deprived of some good risks, compensation is probably more than established by a preponderance of what might have proved bad risks. It might seem here that the balance is in favour of the company, and the obligation toward it fulfilled; but the balance is not in favour of the company, and the obligation is not fulfilled if there exists any possible way of separating the good from the bad. On the other hand, duty to the public demands that none who come within the limits of application physically sound, desiring the benefits of life insurance, should be excluded. If, then, a perfectly healthy applicant is rejected by reason of a sound, pertaining simply to some mechanical factor, standing in no sort of relation to a pathological process, but which appertaining to another individual would be indicative of grave alterations of vital structures, he suffers an injustice for which the medical examiner is not blameless if there be any way of discriminating as to the nature of the murmur in the one case or the other. The applicant and his assigns are injured in that they are deprived of the benefits which life insurance, in its various forms, affords, and to which they should be entitled.

It is the object of this paper to present in a plain practical light what assistance cardio-sphygmography has proved capable of rendering toward the elucidation of the dubious elements in the order of occurrences we have

referred to. By the term *cardio-sphygmography*, of course is meant the simultaneous tracing of the heart and some one of the arteries, one trace above the other, upon the same receiving slide or tablet, together with a time trace below, in seconds or fractions, so that differences in time between the two traces may be easily and accurately computed. The difference in time between the contraction of the ventricles of the heart and the impulse in an artery—or the time difference between two portions of the same artery, or an arterial trunk and one of its branches—forms the basis upon which the deductions from sphygmographic tracings are principally made. Hence it may be seen that instruments which are capable of registering only a single trace, and have no chronographic attachment, have little clinical or physiological value. To be able to draw correct inferences respecting the double registry in any particular case, we must know what are the normal time differences between the heart and the various arteries which permit of investigation. These have been very closely determined by Dr. A. T. Keyt, by means of his compound sphygmograph, as follows: with a heart beating at the rate of 72 pulsations per minute.

The average time difference between the contraction of the ventricle and the pulsation in the carotid artery is about .0833 of a second = to $\frac{1}{12}$ of a second.

The average time difference between the heart and the temporal artery in front of the external auditory meatus is about .100 second, or $\frac{1}{10}$ second.

Between the heart and the subclavian artery, above the clavicle, about .077 second = to $\frac{1}{13}$ second.

Between the heart and the radial artery about .1538 second = to $\frac{1}{6.5}$ second.

Between the heart and the femoral artery about .1428 = to $\frac{1}{7}$ second.

Between the heart and the dorsalis pedis artery about .216 = to $\frac{1}{5}$ second.

The cardio-carotid time difference is approximately one-tenth the duration of the pulsation. Thus, if the pulse-rate is 60 per minute, the pulsation is one second long, and the normal time difference would be $\frac{1}{10}$ of a second; if the pulse-rate is 72, the pulsation has a duration of $\frac{60}{72} = \text{to } \frac{5}{6}$ of a second, and the normal time-difference between the heart and carotid artery would be $\frac{1}{10}$ of $\frac{5}{6}$, which equals $\frac{1}{12}$ of a second. This ratio of difference to duration of pulsation holds between 60 and 120 beats per minute, but beyond these limits there is no certainty that it obtains.

The carotid artery is commonly selected in making comparisons of time difference, because it is nearest the heart of any artery readily accessible for observation, and in points involving the integrity of the central organ, or the ascending or transverse portions of the aorta, it must necessarily furnish the least equivocal sphygmographic data.

Variations in the normal time interval are produced by aneurism, heavy aortic valves, aortic regurgitation, mitral regurgitation, and rigid arteries.

INCREASING TIME-INTERVAL.

Aneurism.
Heavy aortic valves.
Mitral regurgitation.

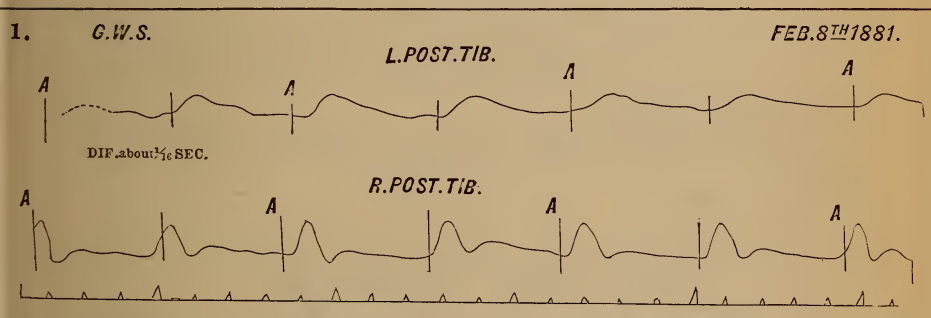
DECREASING TIME-INTERVAL.

Aortic regurgitation.
Rigid arteries.

INCREASING THE CARDIO-ARTERIAL TIME-DIFFERENCE OR INTERVAL. *Aneurism*.—It has been demonstrated by M. Francois Franck¹ and Dr. Keyt² that aneurism retards the transmission of the arterial wave between the heart and the vessels beyond the aneurism, which receive their blood-supply through it. However, according to the clinical observations of Dr. Keyt,³ aneurism, to cause pulse delay, must have “free communications, large cavity, and yielding walls,” while one with converse characteristics, “narrow orifice or small cavity, or resisting walls, may show no abnormal retardation. Deformation of the pulse has no value in the sphygmographic consideration of aneurism, indicating only “arterial obstruction which may originate from other conditions as well as aneurism.”

Fig. 1 supplies the tracings in a case of aneurism of left popliteal artery, showing the delay typical of the aneurismal condition.

Fig. 1.



Time-difference between posterior tibials about $\frac{1}{10}$ second. Normally there should be no difference in time.

Heavy Aortic Valves.—That heavy aortic valves induce abnormal pulse delay has been shown by Dr. Keyt.⁴ The influence of these factors upon the time-difference is well shown by the accompanying graphic delineation, Fig. 2, together with the more salient post-mortem features of the case from which it was obtained.

I made the *post-mortem* examination, assisted by Drs. Keyt and Lowry, April 9, 1881. Left ventricle hypertrophied, left auricle normal, right auricle and ventricle dilated and hypertrophied; mitral, tricuspid, and pulmonary valve normal. Aortic valves had deposited upon their upper

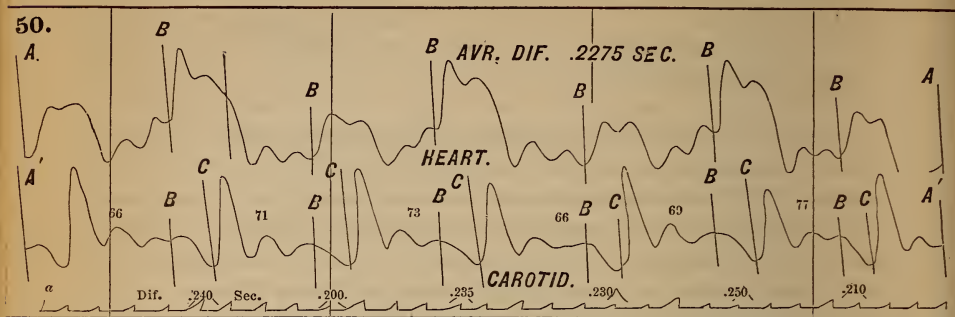
¹ Journal de l'Anat. de la Physiol., t. xv. (Mars-April, 1879).

² Boston Med. and Surg. Journal, Sept. 30, 1880.

³ N. Y. Med. Record, Nov. 29, 1879.

⁴ Med. Record, June 4, 1881.

Fig. 2.

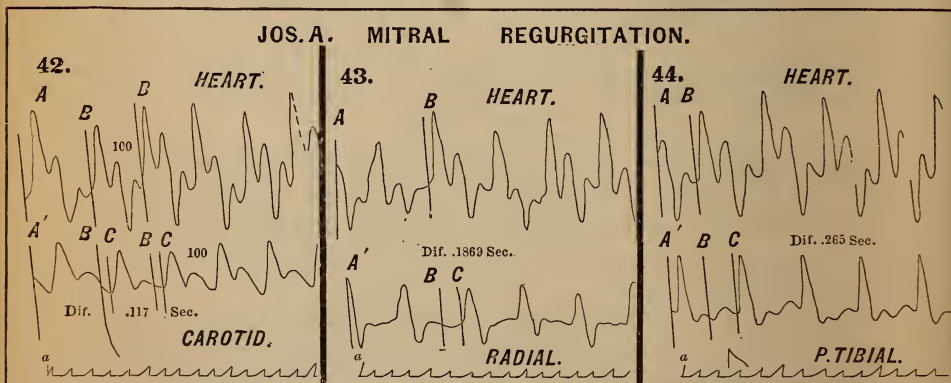


Average time-difference in Fig. 2, .2275 second = to $\frac{1}{4}$ second. Normal time-difference $\frac{1}{12}$ second.

surfaces enormous masses of rough calcareous matter. The overlapping borders of two segments, in nearly half their extent were united, forming a rigid septum, and leaving a triangular space into which fitted the third segment. This segment was pliable, and though it contained a calcareous deposit, measuring three-eighths of an inch in its thickest part, it performed the office of opening and closing the orifice, and did not permit of regurgitation. When closed, the segment overlapped by a little the rigid border of the opening, but slight pressure would cause it to sink below the rim, where it remained, as if locked, until commensurate pressure was applied in the opposite direction.

Mitral Regurgitation.—The cardio-sphygmographic researches of Dr. Keyt¹ have revealed a notable pulse delay from mitral regurgitation. Fig. 3 is in illustration.

Fig. 3.



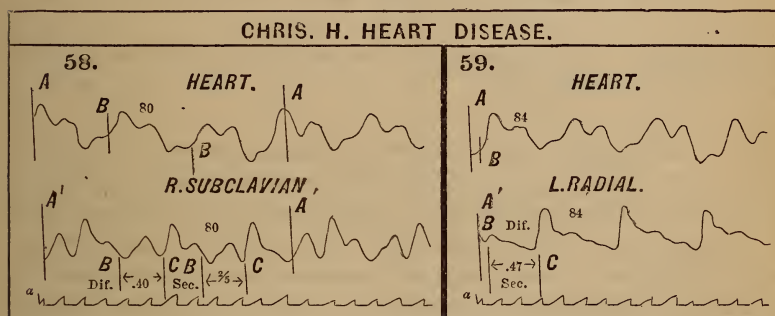
Cardio-carotid time-difference .117 second or between the $\frac{1}{8}$ and $\frac{1}{7}$ second. The normal time-difference with pulse at 100, as in this case, should be $\frac{1}{17}$ second.

¹ Cin. Lancet and Clinic, March 29, and April 19, 1879, and N. Y. Med. Record, Feb. 14, 1880.

The *post-mortem* examination of the subject furnishing the above tracings, as conducted by myself, assisted by Drs. Keyt and Mecum, showed cardiac hypertrophy, normal aortic, tricuspid, and pulmonic valves, while the segments of the mitral valves were thick and leathery, with a thick layer of firm vegetations upon the auricular surface of the larger segment; the auriculo-ventricular orifice guarded by this valve was dilated, and permitted of free regurgitation.

Either of the three agencies already mentioned, operating singly, occasion plainly discernible retardation of the pulse, but when they are combined the delay becomes very marked. An example of all three factors, acting together, may be viewed in the tracings exhibited by Fig. 4.

Fig. 4.



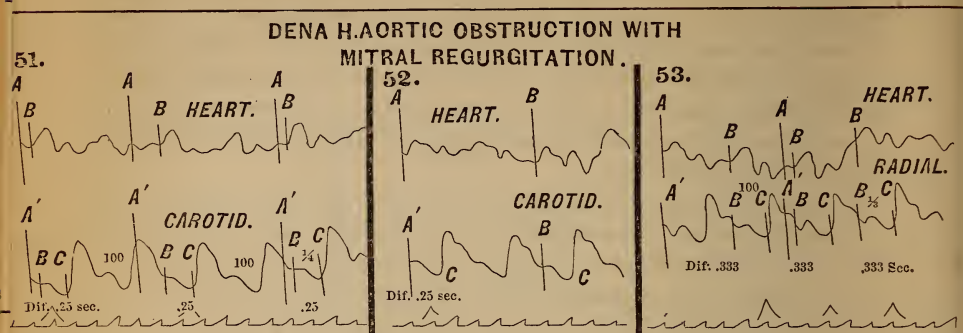
Cardio-subclavian time-difference, $.40 = \frac{2}{5}$ sec. Normal time-difference $\frac{1}{15}$ sec.

The subject from whom these tracings were obtained died November 16, 1879. From the post-mortem notes at the Cincinnati Hospital was gleaned the following: Heart fatty, weight 15 ounces; just above the aortic valves were two aneurismal pouches, one projecting forward and to the right, the other forward and to the left. The first contained no clots, the other was filled with laminated fibrin, was the size of a small apple, pushed its way in various directions, and pressed upon the pulmonary artery in such a manner as to occlude this vessel entirely. The aortic valves were much *thickened*, but competent by the hydrostatic test. The mitral valve was filled with nodular vegetations and incompetent. Tricuspid and pulmonary valves were normal.

The next cardio-sphygmograms, Fig. 5, instance the pulse delay arising from a combination of heavy aortic valves and mitral regurgitation:—

The person supplying tracings Fig. 5 died in the Cincinnati Hospital February 23, 1879. The autopsy showed the aortic valves to be the seat of extraordinary vegetations, not permitting regurgitation, but so heavy as to require material augmentation of the ventricular pressure to

Fig. 5.

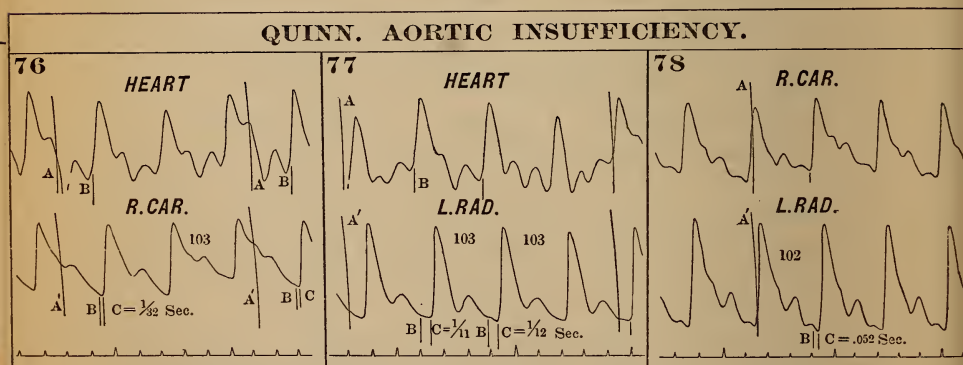


Cardio-carotid time-difference, $.25 = \frac{1}{4}$ sec. Normal time-difference $\frac{1}{12}$ sec.

force them open. The segments of the mitral valve were thickened, rigid, and manifestly incompetent.

DECREASING THE CARDIO-ARTERIAL TIME-DIFFERENCE OR INTERVAL. *Aortic Regurgitation.*—To M. Francois Franck¹ and Dr. Keyt² we owe the knowledge we possess of the influence of aortic insufficiency upon the transmission of the arterial pulse wave. By the graphic method these investigators have been enabled to ascertain a decrease in the cardio-arterial time-difference as the effect of aortic regurgitation. Cardio-sphygmograms, Fig. 6, are illustrative.

Fig. 6.



Cardio-carotid time-difference $\frac{1}{32}$ sec. Normal time-difference at 103 about $\frac{1}{17}$ sec.

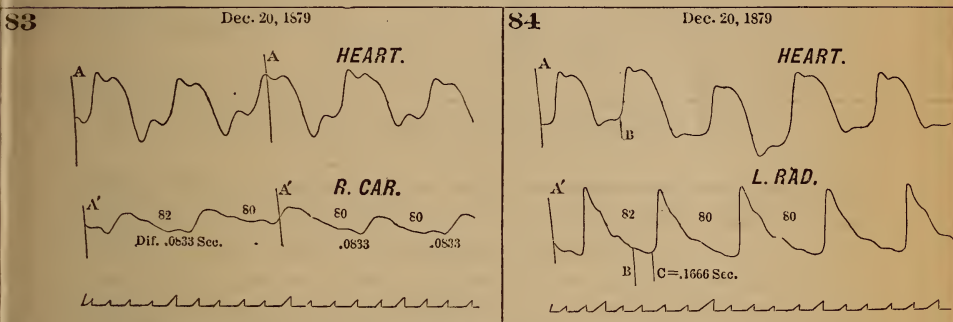
The case from which were derived the above tracings was in the Cincinnati Hospital, service of Dr. C. G. Comegys. All the usual physical

¹ Op. cit.

² Op. cit.

signs of free aortic regurgitation were present. As yet no opportunity has been met with to verify pure aortic insufficiency post-mortem. But where the demonstration is so complete that aneurism of sufficient degree causes pulse delay, graphic tracings in which this condition figures with aortic regurgitation, become available in determining the influence of the latter upon the arterial wave transmissions. Such a combination is marked by tracings Fig. 7:—

Fig. 7.



Cardio-carotid time-difference $.0833 = \frac{1}{12}$ sec. Normal time-difference $.0833 = \frac{1}{12}$ sec.

Tracings Fig. 7 are from a man who had been under the professional care of both Dr. Keyt and myself, in whom we found, post-mortem, the left ventricle hypertrophied, the mitral valves slightly thickened toward the base, but competent; aortic orifice enlarged and aortic valves thickened, corrugated, and calcified throughout, and evidently wholly incompetent. The ascending aorta was greatly dilated, atheromatous, and studded with calcareous matter, while the transverse portion of the arch was the seat of a large aneurism fully three inches in internal diameter, and with soft and flabby walls.

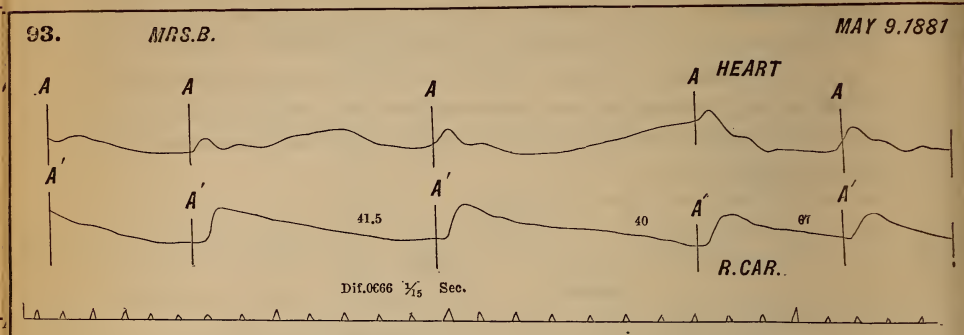
The aneurism in this case was such as must have caused notable pulse delay had it not been counterbalanced by the precipitation of the pulse incident upon aortic regurgitation. The precipitation, Dr. Keyt¹ explains, by presuming that "the base of the arterial column rests against the sides of the ventricle instead of against the aortic valves, and is advanced, causing rise of the pulse with the first movement of ventricular contraction."

Rigid Arteries.—Rigid arterial vessels, such as are met with in the aged, increase the rate of pulse transmission, as may be seen by tracings Fig. 8:—

Tracings Fig. 8 were from Mrs. B., æt. 78. She suffered from dyspnœa, cough, dropsy, and debility, and had an irregular, and, at times, slow pulse. There was a systolic murmur distinct over the cardiac area,

¹ Boston Med. and Surg. Journal, Sept. 30, 1880.

Fig. 8.



Cardio-carotid time difference about $\frac{1}{15}$ sec. Normal time-difference $\frac{1}{12}$ sec.

plainly heard at both base and apex, but emphasized at a spot midway between these sites. The second sound was pure and clear. Tracings were taken at the Cincinnati Hospital May 9, 1881, where she was a private patient under the care of Dr. Keyt. Death occurred at Newtown, O., from dysentery, July 9, 1881, while under the treatment of another physician. I performed the post-mortem July 11, 1881, in the presence of Drs. Keyt and Witham and medical student Jones. The heart was fatty. There were calcareous and fatty alterations of arterial walls. The aorta was of normal size, and its orifice was uncontracted. The aortic valves were competent, but two segments presented rough calcareous nodules upon their upper aspect. A prominent nodule projected from the ventricular surface of one segment near its attached border. One segment was free from calcareous matter, but was slightly expanded and thickened. The valves were perfectly pliable and competent by the hydrostatic test. The mitral and tricuspid valves were slightly thickened, but competent, as were also the pulmonic valves.

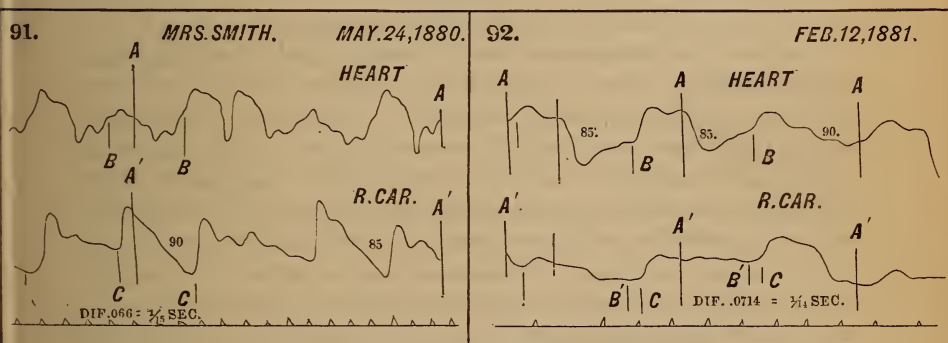
In the above case the cardiac second sound was perfectly clear, and there was a systolic murmur with greatest intensity midway between the base and apex. The absence of all indications of aortic regurgitation led to the decision of pulse precipitation from rigid arteries, and the absence of marked evidences of cardiac hypertrophy gave warrant to the conclusion that even in the right heart there could be no material disturbance of valvular action. The precipitation in the case is really much greater than the figures show, since, with a pulse at even 60 per minute, the normal delay is greater than that which we have given for a pulse of 72 per minute. We will have occasion to revert again to these tracings in the course of this article.

Having considered the conditions which may affect the rate of pulse transmission, a few words may be devoted to the cardio-sphygmographic indications in aortic and mitral stenosis. Aortic stenosis does not alter

the transmission rate of the pulse. A marked degree of stenosis deforms the pulse trace, producing one with sloping ascent and rounded top. It may also occasion intermittency. It all depends, however, upon the degree of narrowing. If the orifice is sufficient to permit of pretty free filling of the aorta by the ventricular contraction, the sphygmographic evidence of aortic stenosis is nil. In regard to mitral stenosis, no cases have as yet come under observation. From the markings of aortic stenosis, and deductions drawn from the course and mechanism of the circulation, it would make no variation in the pulse-rate transmission, but would give rise to a pulse of small tension, and one which might present intermittency at times. The auricular portion of the trace would undoubtedly have unusual prominence.

Affections of the valves and orifices of the right heart, of course, only have a negative bearing upon cardio-sphygmography, because the blood current which traverses them does not pass into channels accessible for investigation. The negative value of the sphygmograph in right heart complications is well exhibited by tracings Fig. 9.

Fig. 9.



Cardio-carotid time-difference about $\frac{1}{15}$ sec. Normal time-difference with pulse at 90 about $\frac{1}{15}$ sec.

Tracings (Fig. 9) were from Mrs. Smith, æt. 59. Her symptoms were shortness of breath, inability to exercise, some cough, anasarca of the lower extremities, ascites, and intermittent pulse. The area of cardiac dullness was much increased, showing decided cardiac hypertrophy. There was a loud diffused systolic murmur, plainly accentuated at the apex, and in all respects, apparently, a typical example of a mitral regurgitant murmur. The second sound was clear and intensified at the pulmonic site. Tracings were taken in May, 1880, and February 12, 1881. Death occurred May 7, 1881. At the post-mortem, Dr. Keyt being present, we discovered the heart generally enlarged, walls of right auricle and ventricle greatly thickened and the great veins dilated. Pulmonic valves normal; right auriculo-ventricular orifice dilated, and tricuspid valves wholly in-

competent, one segment being firmly bound down by adhesions to the side of the ventricle. Aortic valves normal; mitral valves slightly thickened, but competent. Texture of heart fatty and friable.

In the absence of all indications of aortic regurgitation, it was concluded that, in this case, the left heart was properly functioning, and that the lesion must be located in the right heart, where it would not affect the cardio-arterial tracings.

The negative evidence the sphygmograph furnishes of perfect valvular mechanism in the left heart finds good illustration in tracings Fig. 8, together with the data and observations thereto pertaining. The negative evidence supplied by the compound sphygmograph is not less valuable than its positive evidence, and it becomes positive evidence taken in connection with clinical symptoms and physical and objective signs.

From what has preceded, though it has been presented rather in the form of an easy lesson in cardio-sphygmography, it is thought that enough proof has been advanced to establish the graphic method as an important adjunct in differentiating some of the complex instrumentalities which induce disorders in the course of the circulation, and alterations in normal cardiac and arterial sounds. Assuming that this much will be admitted, its advantages in life insurance examinations are great.

It is one of the prerequisites to a life insurance policy that the holder shall be a healthy person. Individuals come up for examination presumably as those who regard themselves perfectly sound, or, at least, presenting no traces of disease detectable to the medical examiner. The examination is made, and an abnormal cardiac murmur is heard. Neither symptoms or appearance or anything in the history of the applicant show disqualifying lesion,—there is nothing but this little whiffing sound, bearing some relation to the heart beats. Without the graphic method the examiner cannot determine whether the sound be structural or functional. Provided the sound be constant, its character and location go for nothing in the differentiation. The risk cannot be given a clean recommendation. The examiner may say that he *believes* the murmur to be functional, and the risk a good one, but he cannot state that he has any warrant for this opinion beyond the appearance and history of the applicant, and the probabilities are that if a medical examiner mentions a heart murmur, the medical director will reject the risk no matter how strongly the former expresses his confidence in a sound of functional character. On the other hand, an examiner, by the aid of the graphic method, conjoined with other means of investigation, may base his opinion upon the functional or structural significance of a murmur with almost as much certainty as upon a mathematical demonstration. If the normal pulse delay obtains between the heart and carotids, and radials and dorsal arteries of the feet, he may say that an instrument of precision gives unequivocal evidence of simple functional or mechanical origin of the murmur. But before he is entitled

to make so confident an announcement, he must have ascertained that there is no aneurism and aortic regurgitation to counterbalance each other in their influence upon pulse transmission, and that there are no valvular lesions of the right heart. This he may do by an entire absence of the clinical symptoms and physical signs indicative of these troubles. Then, too, if the cardio-sphygmograph reveal abnormal pulse delay or pulse precipitation, or pulse deformation or marked prominence of the auricular portion of the trace, the examiner may say that the instrument of precision, in connection with the other features in the case, writes a record of aneurism, or mitral regurgitation, or aortic regurgitation, or aortic or mitral stenosis, as the condition may be. Can an examiner without the assistance of a compound sphygmograph arrive at a conclusion with equal certainty? Without exception, where autopsies have been obtained, the conditions of the circulatory organs have corroborated the deductions derived from a study of the cardio-sphygmographic tracing during life.

Every competent physician of considerable experience knows how fallacious many cases of heart murmurs prove themselves. He finds murmurs in some instances in which he is apprehensive of grave cardiac mischief and discovers that they have disappeared, after a time, without any apparent harm surviving them. On the contrary, instances are unfortunately not wanting of supposed innocent murmurs becoming the heralders of serious cardiac disease. It is the uncertainty which even the most accomplished clinician must feel in regard to many cases presenting cardiac murmurs that makes insurance companies so chary about accepting risks in which there may be possible danger from this source. We think that, with the progress already made in cardio-sphygmography, it is perfectly practicable to distinguish the acceptable from the non-acceptable risks in almost every instance of persons coming under examination with heart murmurs. This method of investigation is new, its data, as yet, comparatively limited, but it promises to be developed until nearly every point in cardio-vascular pathology finds its interpretation by this means.

WALNUT HILLS, CINCINNATI, O.

ARTICLE XII.

A REPORT OF THREE HUMAN MONSTROSITIES. By M. A. KOOGLER, M.D.,
of De Graff, Ohio.

OF late the village of De Graff, Ohio, gave record to three monstrosities: one cyclops and two acrania, in less than two months.

The first occurred in Dr. D. W. Richardson's practice, the second in that of Dr. F. M. Galer's, and the third in the writer's practice.

CASE 1. *Cycloopian Monster*.—Dr. D. W. Richardson was called, on the evening of Dec. 7, 1881, to attend Mrs. D., a multipara, in labour, but did not reach the patient until the child was born. According to the father's statement the child lived ten or fifteen minutes after birth. On inquiry, the doctor could not find anything abnormal in the labour, only an excessive amount of the liquor amnii.

The next morning he came in possession of the child; and brought it to my office for examination.

It was a female, born at term, weighed four pounds, and body well developed. It had but one eye, of normal size, situated in the middle of its face, and a little above where the mouth should have been.

The nose consisted of a mere conical fleshy semi-tube, starting out by its smaller end, immediately above the eye; its dimensions being a little over an inch in length, and about half an inch in diameter at its free extremity. It contained no cartilage, and, instead of two anterior nares, there was but one small, round opening, or canal, about one-fourth of an inch in depth. It was quite soft and flexible, and hung loosely over the eye.

The maxillary bones were united, and no line between them could be determined. The mouth consisted of a small aperture, and situated under a small fold of skin, immediately beneath the symphysis of the inferior maxillary bone. A probe could be passed through this small opening into the throat.

The ears were of normal size, but situated much lower, and approaching each other.

There were apparently no external auditory canals, but, instead, there were two small depressions.

Fig. 1.



Cycloopian monster. Head flexed.

Fig. 2.



Cycloopian monster. Head extended.

The ears were symmetrical, and the lobes and the cartilages below the tragi and anti-tragi were absent, and in their place, running inwards and approaching one another, were two slit-like openings, about one-third of an inch in length. These openings communicated with the larynx, and a

probe could be passed in the one and out of the other. The father stated that during the time it lived, "its breathing was through these openings." The appearances of the monster are well shown in the accompanying drawings (Figs. 1 and 2).

CASE II. *Acranial Monster*.—Dr. F. M. Galer was called, on the evening of Dec. 9, 1881, to visit Mrs. E., a multipara, who was in labour at term. After the os became thoroughly dilated, a digital examination revealed nothing, and it was thought to be a breech-presentation.

The membranes were ruptured, and two peculiar eminences were felt, but the exact condition could not be determined until the head presented externally, when an acrania monster was discovered.

Duration of labour eleven hours. The child was born alive, female, weighed six pounds, and lived a short time. *Post-mortem* examination twelve hours after birth. The body and extremities were well developed, with the exception of the thumbs being a little too long, and two of the fingers, on the left hand, being drawn down into the palm.

The head of the child was badly deformed, or, more properly, deficient. The bones of the cranium, that were present, were the orbital and nasal portions of the frontal, mastoid, and petrous portions of the temporal, ethmoid, sphenoid, and the basilar portions of the occipital.

The cranial bones were, therefore, absent down to the base, and the space was covered with a membrane, having the appearance of the dura mater, running into the hairy scalp on its borders.

Anteriorly were two glandular-like eminences, about the size of an almond. Beneath the membrane was a small quantity of fluid.

The cervical vertebræ were wanting, and the first dorsal articulated with the cranium.

Nothing could be found corresponding to the medulla oblongata. The most noticeable feature in the case, independent of the malformation of the child, was the abnormal amount of the liquor amnii.

The face had an idiotic expression, the upper eyelids very prominent, mouth large, lips thick, and nose flat. The ears were of normal size, and the helices drawn forward, giving them a drooping-like expression.

CASE III. *Acranial Monster*.—I was called, on the morning of Jan. 26, 1882, to visit Mrs. G., a multipara, who was supposed to be in labour at ten months.

On examination *per vaginam*, I found the os well dilated, and the membranes protruding, but the presenting part was too high to be within reach, and I consequently thought it to be a breech presentation. I was unable, by abdominal examination, to diagnose the position of the child. I ruptured the membranes, and the waters escaped with a rush, and in thrice the quantity I had ever seen on any previous occasion.

After the waters had escaped, the presentation was still too high to be determined with any certainty, and I was uncertain as to what part was presenting, until I introduced my hand into the uterus, and found it to be a deformed head.

The child was born in first position about one hour after the membranes were ruptured. The child was born alive and made a few movements, when it died of asphyxia.

It was a female, weighed five and one-half pounds, body and extremities well developed, and the deformity of its head parallel to the preceding case.

The whole of the forehead, summit, and, as nearly as could be determined, the greater portion of the occipital bone were wanting. The only

substance, that could be detected to resemble brain-tissue, were two masses, not so large as almonds, situated anteriorly and immediately above the orbits.

The base of the brain was covered by membranes externally resembling the dura mater, and ran into the hairy scalp. Beneath the membranes was a small quantity of fluid not exceeding one ounce. Its face presented an idiotic look, the mouth wide, lips thick, and separated; nose very flat, and upper eyelids protuberant. The neck was short, and as far as could be determined the cervical vertebræ were wanting. The ears were of normal size, and the alæ were rolled upon themselves. No *post-mortem* examination was permitted.

There was an abnormal amount of liquor amnii in each one of these cases.

ARTICLE XIII.

DISSECTION OF A HUMAN OTOCEPHALIC CYCLOPS MONSTROSITY. By ROBT. MEADE SMITH, M.D., Demonstrator of Physiology, and ANDREW J. PARKER, M.D., Professor of Zoology in the University of Pennsylvania.

AT the request of the Mütter Museum Committee of the College of Physicians of Philadelphia, who obtained possession of the specimen, we were able to dissect the Cyclops monster, described as Case I. in the preceding article.

We find it necessary to make very few additions to the description there given of the external appearances, though dissection enabled us to correct several errors which were unavoidable with the exterior alone for a guide. We find that the monster belongs to the group of *otocephala* of St. Hilaire, and to the division of this group which he calls *edocephala*, characterized by the tendency to fusion of the external auditory apparatus beneath the head, the rudimentary condition of the lower jaw, absence of mouth, and presence of a rudimentary nasal apparatus, in the form of a proboscis, above a single eye placed in the centre of the face.

The specimen referred to us for description was that of a female fœtus, probably, from the undeveloped condition of the larynx and finger-nails, in the eighth month of gestation. The only abnormality was in the development of the head, and our description, therefore, will be confined to that region :—

The general shape of the cranium is normal, with the frontal region at first sight apparently well developed, no suture being perceptible between the frontal bones. The frontal protuberances are represented by two marked prominences at the line of union of the frontal and parietal bones; although, therefore, really malformed, the general appearance of the frontal region is that of a normal skull. The circumference of the head over the frontal protuberances is 26.3 centimetres. The occipital and parietal prominences are

well developed, and the occipital and frontal fontanelles occupy their normal positions; the latter, however, being triangular in shape, with the base anterior, instead of quadrangular. Situated 4 cm. behind the frontal fontanelle, and 1 cm. in front of the occipital fontanelle, in the line of the sagittal suture, there is an oval defect in development of the parietal bones, 2 cm. in diameter laterally, and 15 mm. in antero-posterior diameter.

Situated immediately below a quasi glabellum, 15.1 centimetres from the occipital prominence, there is a fleshy, flexible, trumpet-shaped proboscis, 2 centimetres in length, 1 centimetre in diameter at its free end, and 5 millimetres in diameter at its point of attachment. It is covered throughout with integument, continuous with that of the frontal region, which, at its free extremity, is involuted to form a single blind pouch 3 millimetres in depth and in diameter.

Immediately below this rudimentary nasal apparatus, and overhung by it, is situated a single eye, placed in the median line, in a bony orbit of nearly circular outline, the diameter of the palpebral fissure being 16 millimetres. The upper and lower eyelids are feebly developed, and meet at each side in a shallow groove or furrow, extending outwardly 3 millimetres; the upper lid is circular in outline at its margin, and freely separated from the eyeball to the depth of 3 millimetres; eyelashes are well marked, and, although the frontal region is covered with faint downy hair, there is no indication of an eyebrow. The lower eyelid has a crescentic emargination in the median line, where it is attached to the eyeball, the remainder of the lid being free from the eyeball to the depth of 3 millimetres, as in the case of the upper lid. From the feeble development of the eyelids the eyeball is left considerably exposed.

Below the single orbit the superior maxillary bones are easily detected; they are narrow and more flattened laterally than is normal. Below the inferior margin of the superior maxillary bone there is a second fleshy prominence, closely resembling in general outline a normal chin; no signs of an inferior maxillary bone can, however, be detected. At the summit of this tuberosity, which is about 3 centimetres in diameter, and 2 centimetres in height, there is situated a circular opening, 3 millimetres in diameter, communicating with a blind pouch 23 mm. in depth, and of the same apparent breadth.

The neck is somewhat flattened antero-posteriorly. On its upper portion, displaced below the base of the skull towards the median line, are the external auricles, the external auditory meati being represented by two slit-like openings, 23 millimetres apart, occupying their normal relations to the auricles, inclined downward and toward the median line. A probe can be readily passed through these openings into the pharynx. The helix and anti-helix are moderately well-marked, and the anti-tragus and lobe of both ears are present; the tragus is not discernible.

On removing the calvaria it was found that the brain did not completely fill the cranial cavity. The cerebrum was found incompletely divided into two hemispheres, anteriorly no separation having taken place; posteriorly, however, the cerebral sac diverging into two lateral masses. The frontal lobes of the hemispheres were represented by a single mass, containing the conjoined lateral ventricles; the temporal lobes were normally developed as regards their form and position, and separated from the common frontal lobe by a distinct fissure of Sylvius; the posterior lobes were absent, there being no posterior horn of the lateral ventricle. The posterior divergence

of the cerebral sac completely exposed the thalamencephalon, mesencephalon, and cerebellum.

The dura mater and pia mater were tightly adherent to the surface of the cerebrum; the cerebral falx was absent, unless it be represented by the two diverging folds of dura mater, which enveloped the diverging lateral cerebral masses. The tentorium was represented by two crescentic folds, extending out a short distance from the petrous ridge. The longitudinal sinus was, of course, entirely absent; there existed, however, two venous channels originating at the point of divergence of the cerebral lobes, whilst posteriorly they followed the divergence of the lobes to empty into the lateral sinus at the position of the jugular foramen, instead of at the normal position opposite the internal occipital prominence.

The dura mater was firmly attached at a point corresponding to the crista galli, which was, however, not developed.

The pia mater followed the dura mater, and the velum was represented by a distinct fold, which did not, however, extend into the lateral ventricles.

With the exception of the fissure of Sylvius, there were no signs of fissures or convolutions, the surface of the cerebral sacs remaining entirely smooth; the cerebellum, however, exhibited faintly marked transverse fissures.

From the disorganized condition of the brain we were unable to determine completely the structure and relative position of many of its parts, but we present the following as perhaps of interest: The lateral ventricles were represented by a single cavity, of a horse-shoe shape, its limbs passing backwards into the diverging cerebral sacs; the septum lucidum, fifth ventricle, fornix, and corpus callosum were entirely absent. No corpora striata were observed, though, from the disorganized condition of the brain, it is possible that they escaped identification. The conjoined lateral ventricle communicated by a large opening, twelve millimetres in diameter, representing the foramen of Monro, with the third ventricle. The optic thalami, pineal body, and infundibulum were present, but no trace of the pituitary body was found. The mesencephalon was normally developed, the Sylvian aqueduct passing from the third to the fourth ventricle, having above it the quadrigeminal bodies and valve, and below the cerebral peduncles. Nothing abnormal was noted in connection with the cerebellum, medulla, pons, or fourth ventricle.

On removing the brain from the cranial cavity, it was found that the olfactory lobes were absent, as were also the optic tract and chiasm; the latter being represented in the cranial cavity by a single nerve, which passed through a single optic foramen. The remaining cranial nerves appeared to be normal.

A few observations were made upon the muscles of the face and head. The occipito-frontalis was well developed; the auricular muscles were normal. Rudimentary fibres were found arising from the temporal fossa, great wing, and pterygoid process of the sphenoid and from the zygomatic arch, representing from their origin and direction the temporal, masseter, and pterygoid muscles; from the absence of the lower jaw they were naturally not normally developed. The fatty cheek-pad was well formed, but was situated upon the squamous portion of the temporal bone. An orbicularis palpebrarum encircled the single eye. With regard to the remaining facial muscles, nothing definite could be determined.

The blind pouch, situated below the superior maxillary bones, described

above as communicating with the exterior by a small rounded aperture, proved to be a rudimentary mouth (stomodæum), lined with mucous membrane, and presented upon the alveolar ridge of the superior maxillary bone distinct prominences which were found to be produced by the teeth pertaining to the superior maxillæ; that is, four molars and two canines, the incisors being absent. The salivary glands were not present.

A microscopic examination of the nasal trumpet revealed the following facts: Externally it was covered with integument, which passed into the blind sac situated at the free extremity, without exhibiting any tendency to become converted into mucous membrane. Numerous sebaceous and hair follicles and rudimentary muscular fibres were found. In the interior the lateral nasal cartilages were represented by a truncated, hollow, cartilaginous cone, compressed laterally, notched at the apex, and at the base of the inferior margin showing a tendency to inversion. In the interior of this cone was a nearly circular cavity lined with mucous membrane. This cavity was separated from the blind integumental pouch by a partition about three millimetres thick. No cartilaginous or bony septum could be discovered, either in the proboscis or at its point of attachment to the frontal region.

The eyeball was exposed *in situ* by the removal of the roof of the orbit. The levator palpebræ was represented by a single well developed fan-shaped muscle, supplied by the oculo-motor nerve, arising normally from the apex of the orbit, to be inserted into the superior tarsal cartilage. On dividing this muscle, two straight muscles, lying at equal distances from the median line, were found arising from the apex of the orbit and inserted into the anterior portion of the eyeball; these represented either two superior recti or a single rectus and a superior oblique. The absence of any intermediate tendinous portion and their similarity in origin and insertion, as well as the points hereafter described with regard to the interior of the eye, incline us to the former view. A single inferior rectus and a lateral rectus on each side were found; the right lateral rectus was joined at its anterior third by a band of muscular fibres, probably representing a single inferior oblique, arising from the left inferior wall of the orbit. An ophthalmic ganglion was found situated between the right lateral rectus and the optic nerve. This, together with the relations of the inferior oblique muscle, would indicate that the single eyeball corresponded with the right, whilst the left was undeveloped.

The sclerotic was well developed; the cornea, iris, and pupil circular; a single lens of normal shape with no signs of a groove or fusion of two lenses. The vitreous humour and ciliary processes were normal, and the choroid present as a separate tunic.

The retina was detached and too friable to admit of accurate study. On removing the retina, two coalesced cribriform spots were found, as if the optic nerve had partially subdivided at this point, although outside of the eyeball not a trace of division could be detected. On cross-section of the optic nerve at its point of passage through the sclerotic, it was found that the apparent fusion of two cribriform spots was associated with an attempt at subdivision of the optic nerve at that point, two central retinal arteries being detected, which, outside the eyeball, united to a common trunk. This was the only sign present of any attempt at subdivision, or indication of fusion in the eyeball, though no study could be made of the retina.

On examining the auditory apparatus, the two external auditory canals were found to communicate directly with the pharynx, their entrance being

surrounded by two tympanic bones separated by an interval of 17 mm.; there was no sign of tympanic membranes. Lying between the tympanic bone and the periotic capsule (hyo-mandibular cleft) were found the malleus, incus, and stapes of each side. The handles of the two malleus were directed downwards, forwards, and inwards, and the head of each articulated with an incus; the processus gracilis of each malleus turned inwards towards the median line, and was united by a slender splint-like bone with its fellow of the opposite side. This probably represented an undeveloped lower jaw. The stapes and anvil were partly surrounded by an imperfect bony canal formed by the tegmentum tympani, representing an imperfect middle ear. The two processes of each incus were directed upwards, outwards, and backwards, the long process of each articulating with the stapes whilst the short process was attached to the roof of the imperfect tympanic cavity by a distinct ligament. The stapes articulated with the oval window, and was somewhat deformed. The chain of ear ossicles was, therefore, directed from within outwards instead of the normal reversed condition.

The larynx and trachea were normally developed, the two plates of the thyroid cartilages being ununited. The epiglottis and hyoid apparatus were present, but there was no trace of a tongue. The muscles below the position of the hyoid were found in their ordinary condition, but above there was an indistinct undifferentiated muscular mass which represented the undeveloped muscles of the floor of the mouth. The pharynx was attached to the base of the skull and ended in a cul-de-sac above, separated from the stomodæum by a partition 1 cm. in breadth, no communication existing between the pharynx and the nasal cavity already described.

With regard to the skull, the following may be noted: The occipital segment is normally formed, consisting of the basi-supra- and ex-occipitals. The parietal segment has a well developed basi-sphenoid, two alisphenoids or greater wings, and is completed by well developed parietals. The frontal segment is, however, somewhat modified, the presphenoid is absent, whilst the orbito-sphenoids, or lesser wings, have been displaced backwards, uniting with the basi-sphenoid posterior to the origin of the alisphenoids. They have also approached laterally towards the median line where they have coalesced, presenting in the centre a single optic foramen. The appearance of the combined orbito-sphenoids is, therefore, that of a triangular splint-like bone, having its base resting on the internal upper edges of the approximated alisphenoids, not articulating with the orbital plates of the frontal, and its apex co-ossified with the basi-sphenoid; as a result of this, there is no pituitary fossa, but instead a bridge of bone leaving a space of about 3 mm. between it and the base of the skull. As a consequence, also, of this union of the orbito-sphenoids and absence of the presphenoid, the sphenoidal foramina are represented by a single opening situated between the internal edges of the alisphenoids, and beneath the bridge-like orbito-sphenoid.

The pterygoid processes are small and not well developed.

The frontal bone is represented by a single bone in which, however, a distinct sutural line can be detected. It is greatly malformed, having only about one-half the breadth and two-thirds the normal height. No frontal prominences can be detected, the glabellum and internal angular processes are entirely absent, the supra-orbital ridges of the two sides meeting in the middle line form a single ridge bounding the orbital

cavity above. The external angular processes are well developed, and articulate with the malar bones below. There is a single orbital plate with a large deficiency in the centre corresponding to the ethmoidal notch: posteriorly it articulates with the alisphenoids instead of the orbito-sphenoids. The ethmoids are entirely absent. The temporal bone has all of its elements represented, the petromastoid presenting its normal appearance and relations, with the exception that a thin plate of bone has been given off inferiorly to insheath an imperfect tympanic cavity, taking the place, to a certain extent, of the tympanic bones which we have described above as being displaced to an abnormal position at the base of the skull. The squamosal element has likewise been displaced inwardly so that at the base of the skull they are but five millimetres apart instead of five centimetres, which is about the space normally separating them in a foetal skull of the same age. There is also no trace of a glenoid cavity or fissure, unless the latter be represented by a wide gap lying between the squamosals and the thin plate of bone already described as given off by the petromastoids.

The face is in an exceedingly rudimentary condition, but few of its bones being developed. The ento-pterygoids are present, but have not united with the pterygoid process of the sphenoid, being, indeed, situated posteriorly to them. The palate bones are likewise feebly developed, being represented by two small plates of bone lying between the pterygoid processes. Of the two superior maxillaries, only the bodies are developed, and of these, the alveolar borders form the greater part, the palate plates, parts bounding the nasal cavities, tuberosity, infra-orbital ridges, and pre-maxillary portion and nasal spines being entirely absent. A small orbital surface, formed by the conjoined plates of the two bones, exists, however, and the two infra-orbital ridges are well marked.

The malar bones are normally formed, but owing to the arrested development of the superior maxillary bone, they approach one another and are separated in the median line by a distance of five millimetres instead of four centimetres, the normal intermalar space. On this account they form almost entirely the inferior and external boundaries of the orbit. A distinct zygomatic process is present, but it does not unite with the zygomatic process of the squamosal.

Of the remaining bones of the face, the lachrymals, nasals, turbinates, and vomer, are entirely absent, whilst the inferior maxillary is only represented by the small splint-like bone previously described.

The single orbit is formed by the following bones; Above by the orbital plate of the frontal, posteriorly by the orbital surfaces of the alisphenoides, inferiorly and laterally by the malars and conjoined orbital plates of the superior maxillaries. The elements absent that enter into the normal construction of the orbit are the orbital surfaces of the ethmoid, the lachrymal, orbito-sphenoids, and orbital plates of the palate bone. The shape of the orbit does not differ widely from the normal form, and has entering into it the following apertures: A single optic foramen, a single sphenoidal fissure formed by the union of the right and left, two rotund foramina, and two sphenomaxillary fissures.

The nasal cavities are entirely absent.

The chief interest to be derived from the study of monstrosities, such as described above, lies in the explanation of the causes which have led to the various deviations from their normal development. While we have

found accounts of numerous monsters which, from their general appearance, probably resembled, in many points, the one described, the narrow-mindedness of custodians of museums, who are satisfied with a general description of the exterior and are then content to suspend the specimens in jars for the amazement and *instruction* of the curious, has greatly interfered with a scientific knowledge of the laws of teratology. Without a thorough dissection of the internal parts nothing, as to the causes producing deformity, can be determined.

A study of the monstrosity described above shows that all the deviations from the normal type can be explained by the modification or non-development of certain parts.

Normally, the brain develops in the following manner: The anterior end of the primitive medullary tube dilates into three cerebral vesicles; of these the first remains as the thalamencephalon, sending off anteriorly two prosencephalic buds to form the hemispheres. These, in their turn, send off each a secondary bud, the rhinencephalon, or olfactory lobe. In the case before us, however, the thalamencephalon has been normally developed, but instead of sending off a pair of prosencephalic buds, but a single bud was formed, which, however, partially divided posteriorly into two. The reason for considering that but a single bud was given off, rather than that fusion occurred between two primitive buds, lies in the absence of any partition wall between the homologues of the two lateral ventricles. No secondary buds, or rhinencephala, were given off, hence the entire absence of olfactory lobes.

In the same manner, we believe but a single optic bud appeared; hence the median position of a single eye.

The explanation ordinarily given for the approximation of two eyes, or the presence of a single eye in the comparatively well-described group of simple cyclops monstrosities, is that two primitive optic buds have converged and coalesced in the median line; in many cases this may be the correct explanation; but where, as in the present instance, but a single eye has appeared, or where there is a close coalescence of two eyes, it appears to us much more probable that but a single median primitive optic bud has been given off from the thalamencephalon, and that this bud either remains entirely single, thus producing but a single eye as in this case, or that in those cases which present an apparent fusion of two eyeballs and optic tracts, the primitive median optic bud has subdivided more or less completely into two. It is difficult to conceive that after the coalescence of two primitively distinct optic buds, the mesoblastic tissues, which go to form the tissues of the eyeball, should be able so to adjust themselves as to produce a single perfect and normally developed eye.

Owing to this development of a single optic bud, or it may be the convergence and coalescence of two primitively distinct buds, the molecular

arrangement of the embryonal cells situated at the base of the skull is so disturbed that we find in all these cases of cyclops that the fronto-nasal process fails to develop. As a result of this follows the entire absence of all the bony parts, developing normally from this process, viz., the ethmoid, nasals, lachrymals, vomer, and pre-maxillary bone, and hence the presence of the eye beneath a nasal proboscis belonging only to the skin.

The absence of the lower jaw and malformation of the auditory apparatus, an arrangement which, so far as we have been able to learn, is entirely unique, may be explained as depending upon defective development of the first visceral arch. Normally from the base of the primitive cartilaginous cranium we have given off on each side two cartilaginous ventral rods, which pass down into the anterior visceral arches. From the first of these we have given off the palato-pterygoid plate, which passes out into the maxillary process, to form the basis of the upper jaw, whilst the continuation of the rod extends downwards, under the name of the cartilage of Meckel, into the mandibular arch and forms the basis of the lower jaw. The second cartilaginous rod forms the hyoid series. In the higher vertebrates the proximal element of the mandibular arch is converted into the malleus, the homologue of the quadrate bone of lower forms, whilst the proximal element of the hyoid arch is converted into the incus, the homologue of the hyo-mandibular. The remaining auditory ossicle or stapes is formed, according to most authorities, from a part of the periotic capsule.

In the present case, the deviations from the normal form have been produced by the irregular development of the cartilages of Meckel. These, instead of passing downwards, turned inwards towards the base of the skull, to meet in the median line. Hence, therefore, the lower jaw, which consists of a pair of membrane bones developed in the tissues surrounding the cartilages of Meckel, is represented by a small, slender, splint-like bone, lying at the base of the skull, at a point corresponding in position with that attributed above to the irregularly developed cartilages of Meckel. From this arises also the displaced position of the ear ossicles, which occupy a position at the base of the skull corresponding closely to their normal position in an early stage of development of the hyomandibular cleft.

The hyomandibular cleft, or space between the primitive mandibular and hyoid visceral arches, remains in the higher vertebrates as the external auditory meatus, tympanic cavity, and Eustachian tube. Owing to the approximation of all the parts towards the median line, this canal has been in this specimen very much shortened; the tympanic cavity exists, as we have already described, in an imperfect condition, bounded by the petromastoid and squamosal elements of the temporal bone alone, the tympanic bone, from its displaced condition, not entering into its construction. As a result of this, we find that the portion of the canal corresponding to the

external auditory meatus is quite short, and enters the pharynx below the position of the middle ear, though communicating freely with it. A Eustachian tube does not exist, since the ear ossicles are not entirely closed within the petro-mastoid bone, the malleus lying entirely within the cavity of the pharynx. The internal ear was normal.

ARTICLE XIV.

ON THE USE OF CARBONATE OF AMMONIA AS A STIMULANT. By E. P. BREWER, M.D., Ph.D., of Norwich, Conn.

FEW remedies have been longer known¹ or more widely used, than carbonate of ammonia, and yet so scantily understood in *modus operandi*. Most varied and extravagant powers have been ascribed to it. It has passed through every phase of therapy, and mingled with almost every order of medicinal classification. In turn it has been pronounced a convulsant, an antispasmodic, a derivative, a constructor, a depressant, and to-day it figures in the capacity of a stimulant. Our modern therapeutics tell us that it enhances the physiological powers of the gastric and bronchial membranes, that it vivifies the circulating and nervous system, and spurs into activity the excretory emunctories. All of this being accepted as a natural result, the lapsing stages of disease are purported to be met and subdued by its administration. Typhoid fever, pneumonia, septicæmia, and adynamic states are almost as certain of receiving their portion of it as is ague its portion of quinine. And its value in preserving life in a multitude of cases I do not deny. However, it is my earnest belief that we should have more fixed indications for its use, that it has become too much the habit of using this drug as a *dernier ressort*, unguided by reason and without recognizable indication beyond a general condition, an adynamic state. Impelled by this belief, I entered upon a series of experimental inquiries to determine, if possible, the indications for its use as a stimulant, the results of which I will now record.

In the variable scope of action of the ammoniacal salts perhaps no action is so common as their stimulating properties. It pervades in varying intensity every one of the compounds now known, and although always present, an intensity of sufficient power to be of large medicinal value is to my knowledge confined to one salt, the carbonate of ammonia. This gives an individuality to the drug and marks that feature that has preserved its memory in the annals of medicine through the darkening shadows of many centuries. Standing unique in its group in that peculiar power of

¹ This medicine was long known to the Hindoos.

exaggerating physiological activity, a study of its chemico-physiology if rightly conducted to success will elicit the basis of force in this specific drug.

At the onset it is of paramount importance that we perfectly understand the changes occurring in the stomach and the form of its entrance into the blood. To this end we have recourse to practical study.

Expt. 1. Kitten, weight 14 ounces; pulse 104; respirations 30 per minute. Exhibiting chloroform to narcotism, a soft catheter was passed into the stomach and five grains of carbonate of ammonia, in solution, injected. Slightly withdrawing the catheter, I introduced the end of it into a water-bath of lime-water in a manner that any gas generated in the stomach could escape and be collected in a receiver. In a few moments a bubble of gas escaped, then very slowly a series of them, in all perhaps three cubic centimetres. Examining the receiver of lime-water with the gas above it, at their junction a white film was visible, this being fairly distinct with a hand magnifying-glass. The gas gradually disappeared, and in two hours was entirely absorbed, leaving behind only a white sediment. Collecting the precipitate it was found to consist of the carbonate of lime.

The evolution of gas following the ingestion of the medicine, portrays a chemical action between it and the gastric juice, and further, this gas consisting of carbonic acid, as shown by its combination with lime, would seem to prophesy that the drug entered the system in other form than that of the carbonate.

To verify our study, we proceeded as before, and entered upon *Expt. 2*. Excepting a slight residue of unabsorbed gas in the receiver it furnished the results of *Expt. 1*.

Expt. 3. The ammonia was introduced as in the previous experiments, and the catheter withdrawn. In three minutes the cat was bled to death. On opening the abdomen the stomach was found distended with gas. Tying the œsophagus and pylorus, the stomach was removed, and its gaseous contents collected over a water-bath of aqua calcis. Again, the gas united with the lime, forming a precipitate of lime carbonate.

Other experiments (now 10 in number) of like nature gave results in total harmony with the preceding. In view of eliciting the acting agents in this chemical union, we singly placed in contact with carbonate of ammonia all of the ingredients of the gastric juice. No chemical action is determined with any of them except hydrochloric acid. However, when they are placed in contact, ebullition follows, and a gas—carbonic acid—is given off, the chlorine of the acid unites with the ammonia, producing muriate of ammonia, leaving free one atom of oxygen and two atoms of hydrogen, which unite to form water. As a legitimate sequence, we would suggest that the free hydrochloric acid of the gastric juice (Schmidt, Eberle, Prout, Bidder, and Dunglison) combines with the carbonate of ammonia, forming muriate of ammonia and water, and evolving carbonic acid. In the language of chemistry, the reactions may be expressed as follows: $\text{N}_4\text{H}_{16}\text{C}_3\text{O}_8 + 4\text{HCl} = 4\text{NH}_4\text{Cl} + 2\text{H}_2\text{O} + 3\text{CO}_2$.

Muriate of ammonia being the result of the chemical action, it would seem a self-evident truth that upon it devolved the responsibility of effects, and that, when prepared without the body and administered, it

would in efficacy as a stimulant be equal to carbonate of ammonia, and further that their toxic doses would be uniform.

In point of fact, such is diametrically opposite to the testimony of research, the truth of which we will put to test.

Expt. 4. Kitten, weight 13 ounces; pulse 110; respiration 34 per minute. Under chloroform anæsthesia I threw into the stomach *one drachm* of muriate of ammonia. Discontinuing the anæsthesia the animal recovered consciousness, got up and walked about. In a few moments it tried to vomit but was unsuccessful. The nausea apparently soon ceased, and the kitten suckled its mother. The pulse increased to 130, and the respiration to 56 per minute. The kitten was disposed to sleep the rest of the day, and beyond a watery diarrhœa on the following day no other symptoms were manifested.

Expt. 5. Kitten, weight 15 ounces; pulse 106; respiration 35 per minute. *Five grains* of carbonate of ammonia, in solution, were injected into the stomach, chloroform being exhibited. In five minutes the breathing became irregular and deeper, twenty-eight per minute. The animal tries to walk but staggers and trembles, and then ceases the effort, which evidently causes much exhaustion. In twenty minutes the front paws twitched convulsively, and with perfect regularity with the onset of respiration. In thirty minutes the breathing was ten per minute, and the pulse 140, strong, and regular; the twitching of the paws continues.

In sixty minutes life was extinct, the respiration becoming slower and slower until about ten minutes before death, when it became very rapid, and shallow, and ceased. On dissection the stomach was found distended and injected, particularly at its pyloric extremity, while the intestine was normal. Both lungs were intensely congested, and the heart firmly contracted on its left side. Cutting the vena cava, the heart commenced to dilate and contract. Being unable to bury the carcass at that time, I rolled it in a cloth and left it in my study. Three hours later, returning for its burial, I inadvertently removed the covering, and to my surprise found the heart still sluggishly contracting. Entirely severing the heart from the body, and placing it in tepid glycerine and water, the contractions continued two and one-half hours longer, or in all five and one-half hours from the time of death.

To dispel the possibility of tolerance to the ammoniacal salts, in the subject of experiment 4, we submit him, after a lapse of four days, to—

Expt. 6. Weight 13 ounces; pulse 115; respiration 38 per minute. At 9.05 A. M., *fifteen grains* of the carbonate of ammonia are injected into the stomach.

9.10 A. M. Trembling of the extremities; vomiting; pulse 130; respiration 50.

9.12 A. M. Respiration deeper, the inspiratory effort especially prolonged; clonic spasms of the fore and hind extremities.

9.15 A. M. General convulsions and opisthotonos; relaxation quickly follows; pulse 110, full and strong; respiration 20, with prolonged inspiration.

9.17 A. M. The animal utters a cry; the eyes oscillate and become fixed upwards; the tongue protrudes, the jaws work, and the whole body becomes rigid; relaxation follows; pulse 120; respiration 4 per minute.

9.21 A. M. Respiration ceases; the heart continues to pulsate. The time elapsing between the ingestion of the drug and death was sixteen minutes.

Immediately dissecting the body, I found the stomach intensely congested at its pyloric extremity and along the greater curvature; œsophagus normal; lungs filled with blood; the right heart congested; irritating the heart with my scissors it contracted sluggishly. Relieving the distension of the right side by severing the vena cava, the contractions augmented in force. Now removing the heart and placing it in tepid water and glycerine, it retained its contractile irritability for one hour and fifty-five minutes.

The results of experiments 4, 5, and 6 clearly contrast the varying lethal doses of muriate and carbonate of ammonia. Of the former—the muriate—one drachm was taken and retained without deleterious influ-

ence; of the latter—the carbonate—the ingestion of five grains was followed in one hour by death. Again, the animal that took muriate of ammonia (expt. 4) with impunity succumbed in sixteen minutes (expt. 6) after the exhibition of fifteen grains of carbonate of ammonia. Hence, then, we confirm and sustain the assertion of former research that carbonate of ammonia is a more potent poison than the muriate of ammonia.

Hastily reviewed, these facts would seem to invalidate my assertion that carbonate of ammonia is converted into muriate of ammonia, but, in unison with careful study and experiment, I shall show that such is not the case; contrariwise, they form the strongest link in our chain of evidence.

If the distinctive actions of the two salts be due to their assimilation—unchanged—the hypodermic administration of the same quantity as taken in by the stomach should produce at least an equal, if not a better, defined train of symptoms.

This proposition being only susceptible of experimental solution, I resort to—

Expt. 7. Subject a kitten. Weight 12 ounces; pulse 112; respiration 38 per minute. Dissolving ten grains of carbonate of ammonia in ninety minims of water, I injected the whole quantity hypodermically into our subject. In ten minutes the pulse beats numbered 125 per minute, and the respiration 35, otherwise no change was manifested. The appetite and activity remain unimpaired. No abscess followed.

Repeating the procedure in *Expt. 8*, I used 15 grains of carbonate of ammonia, and secured the same result, or rather the same lack of result.

Without remark I will cite—

Expt. 9. Cat. Weight 24 ounces; pulse 95; respiration 28. Aided by chloroform, I passed a catheter four inches into the anus, and injected twenty grains of carbonate of ammonia in solution. A part of it escaped. In ten minutes no symptoms being present, I injected ten grains more, all of which was retained for forty-five minutes. No symptoms being then present, the anal plug was removed, and the bands securing the cat loosened. The animal got up and walked about. In a few moments it passed considerable mucus, and continued to do so at intervals in the next twenty-four hours. No other symptoms were present. The appetite was uninfluenced. The remaining portion of the day it appeared lethargic.

Desiring to corroborate the above I made—

Expt. 10. Kitten. Weight 12 ounces. Cutting into the abdominal cavity, I secured a loop of intestine, opened it, and injected ten grains of carbonate of ammonia in solution. No effect being produced at the expiration of two hours, I then injected ten grains into the stomach. In eight minutes a slight convulsion occurred; in twenty minutes life was extinct. Immediately dissecting the animal, I found the heart still beating. Removing and suspending it in tepid water and glycerine, the contractions continued for two hours and ten minutes.

Our last four experiments (7, 8, 9, and 10) demonstrate that the action of carbonate of ammonia is largely influenced by the avenue of its introduction. By the stomach a rapid and definite action follows; hypodermically, or by the rectum or small intestine, very insignificant results are known, although confessedly a measure of power is exercised (an amount equal and allied to any other ammoniacal salt). Concisely stated, the

result reached is, that *carbonate of ammonia, exhibited by any other avenue than the stomach, sacrifices its distinguishing physiological and toxic properties.*

Inasmuch as a digestive change is effected in the stomach that is unknown to the intestine, the only rational inference is, that by virtue of this process, the distinctive cogency is therein developed or made available.

It has already been shown that the gastric changes depend upon the presence of hydrochloric acid, and, again, that in such situation where it is absent, the drug is inoperative. Now then, if we were to neutralize the gastric acidity and introduce the salt, what would be the result? This leads us to—

Expt. 11. Kitten. Weight 15 ounces. After washing out the stomach with a strong solution of bicarbonate of soda, I injected ten grains of the carbonate of ammonia along with two scruples of soda bicarbonate. Ten minutes later, I washed out the whole quantity with lukewarm water. No untoward symptoms having been presented at the expiration of an hour, I washed the stomach with dilute hydrochloric acid 3ss–3iv, and injected seven grains of carbonate of ammonia. In ten minutes, as before, I washed out the substance with tepid water. During this operation severe convulsions developed and continued until death twelve minutes later, an interval of twenty-two minutes elapsing between the introduction of the poison and death.

We have, at last, reached the experiment that, before all others, links a digestive change to the stomach and fixes indubitably the responsibility upon the hydrochloric acid of the gastric juice. Through its influence the almost innocuous remedy—by the rectum, intestine, and cellular tissue—is transformed into a virulent poison, and gifted with striking medicinal qualities.

Lucid as is the importance of the role played by hydrochloric acid, the manner of consummating this action is not so well defined. It has been suggested that hydrochloric acid, by virtue of chemical affinity united with carbonate of ammonia, forming muriate of ammonia, carbonic acid, and water. To support this supposition, we noted the constant presence of carbonic acid in the stomach after the administration of the carbonate.

Muriate of ammonia, being the only possible remedial agent of this reaction, it would appear we ought to show that the actions of the two salts were identical, but in this we signally failed. Upon what do the specific powers of carbonate of ammonia depend?

That the carbonate is converted into the muriate there can be no doubt; that upon this change depends the powers of carbonate of ammonia, I have distinctly proven; and, further, that the carbonate and muriate of ammonia *do* have distinct specific properties is indisputable.

In considering the chemical qualities of the stomach we momentarily lost sight of two important conditions: 1st. The intermediate state of our compounds in the chemical process; and 2d, the ever acting vital function absorption.

The action of the acid on the salts may be divided into two states, disintegration and construction. Between them the elements exist in a free

state or weak chemical union. For example, betwixt the breaking down of the carbonate by the acid and its reconstruction into the muriate, the hydrogen and chlorine of the acid and the ammonia and carbonic acid of the carbonate must exist uncombined. Although this period may be very brief, it is not too brief for the subtle force of absorption to act upon and utilize the elements as they exist. In this style, in my belief, are the specific actions of the carbonate of ammonia acquired. While the ammonia is in its free state, between the two combinations, it undergoes absorption, and exercises all of the properties we attribute to the carbonate salt. The *correct* formula of the stomachic change is as follows:

$$\text{N}_4\text{H}_{16}\text{C}_3\text{O}_8 + 2\text{HCl} = 2\text{NH}_4\text{Cl} + 3\text{CO}_2 + \text{H}_2\text{O} + \text{O} + 2\text{NH}_4.$$

I maintain that the *action of carbonate of ammonia is not* due to the presence of the carbonic acid in combination with the base, but *is dependent on the absorption of free ammonia while the salt is chemically combining with the hydrochloric acid of the gastric juice.* The instability of the compound which renders it so susceptible of digestion is the quality that ranks it above all other ammoniacal salts.

In support of this *fact* I offer the observations drawn from forty-nine distinct experiments, of which representatives have already been cited.

1st. Carbonate of ammonia, administered by the rectum, cellular tissue, and intestine, is almost completely robbed of its stimulating properties.

2d. By the stomach it acts with great power when we permit the full play of the acid gastric juice; the converse being apparent when we neutralize the acid of the gastric juice.

3d. That the ultimate results of the chemical union is a product totally different in power and latitude of action from carbonate of ammonia.

Analyses of blood made soon after the exhibition of a dose of carbonate of ammonia show an excess of free ammonia.

The details of the analyses are so complex and tedious that I omit them.

Evidences of Stimulation.—Of late years particular stress has been laid on the selective action of stimulants upon the respiratory and cardiac centres; and, in truth, the support of these being the chief objects of stimulant treatment, a study of their relation to drugs is not only logical, but of palpable value. As the pronounced stimulation of the respiratory centre has been long known and utilized, I refrain from remarks, further than to confirm such phenomena as constant and reliable.

In reference to the cardiac centre I believe that its stimulation is more decisive than commonly credited. For illustration, I refer to my experiment hitherto detailed. The effects are clearly divided into two stages. Primarily, the heart appears transiently embarrassed, the pulse is rapid, weak, and irregular. Following hard in its footsteps is the deeper more permanent and valuable action. The pulse becomes full and strong, and regular and slow; the irritable and irregular action subsides into a regular rhythmical discharge of force. The cardiac centre is awakened to exaggerated sensibilities, and the controlling nerve force strengthened.

In twenty experiments I exsected the heart from the body, and suspended it in a lukewarm solution of glycerine and water. The results were varied in the duration of the contractility, yet constant in the exhibition of marked irritability.

For convenience of comparison I tabulate my results:—

Number of experiments.	Duration of contractility after death.
1	5½ hours.
4	4 “
7	3½ “
4	3 “
2	2 “
1	2¼ “
1	1½ “

Average duration of contractility $3\frac{3}{10}$ hours.

The intensity of the irritability *pari passu* with stimulation cannot be as well portrayed to the mind in words as by the eye from Nature's own vivid picture.

Practical Deductions.—The acid gastric juice being the charm, as it were, that loosens the secret powers of carbonate of ammonia, its practical applications are necessarily fettered to the class of maladies in which the gastric functions are but slightly affected. In many forms of acute disease this condition obtains. In its graver types, in which stimulants are required, the system seems to be menaced by the sheer diversion of the vital energies, by the destruction of the systemic equilibrium. The system contains adequate force to retain life and overcome the disease, but it is wanting in the remote quality of exercising it—that quality that we commonly promote by the use of stimulants. Here we have the typical indication for carbonate of ammonia: unimpaired or slightly deteriorated gastric function, failing cardiac and respiratory action, impaired distribution of energy—here the drug will promote the rapid, powerful, and selective regulation of nerve force.

Unlike alcohol, it supplies nothing, *i. e.*, has no nutrient value, its service is comparable to the good overseer to willing subjects, who directs their labours and departs, leaving behind a deep and lasting impression.

In most chronic diseases and in acute disease of long duration, partaking of the typhoidal type, carbonate of ammonia is of no value. The gastric secretions are generally scanty and altered, hence incapable to perform the compulsory act of digestion, and if perchance enough acid were secreted, the remedy would be of little service, for the specific indications for its use are absent. The distributing force is not at fault, there is no surplus of latent energy, the cardiac and respiratory centres are not at discord with this reserve force—no, they are acting to its extreme capacity, the whole circumference of the vitality is worn almost to destruction; support, food is demanded, the vital forces must be cherished.

Plainly carbonate of ammonia would not be remedial; instead of conserving vitality it would lay to waste the fading glow of life, and lead the economy with quicker pace toward the ultimate doom of life—death.

The digestive changes proclaimed by my experiments, instead of involving new principles in the therapy of the drug, appeal to experience for further support, and place its therapeutic indication upon rational and palpable factors. Dr. Gerhard, after an extensive experience in the treatment of epidemic typhus by this drug, in 1836, wrote, in the *American Journal of the Medical Sciences*,¹ that "although we are perfectly aware of its powers as a rapid and effectual stimulant, particularly when the fever is complicated with a disease of the respiratory organs, we were rather disappointed in its effects. It was irregular in its action, and in the dull muttering of delirium of typhus seemed totally without power." This is the reflected experience of every close observer.

I repeat, in the low adynamic states, when the stomach is largely impaired, carbonate of ammonia is "totally without power." The complications of fever, in which the efficacy of the drug is vaunted, occurred at the onset of the disease, or before the stomach was seriously deranged. In consequence of the powerful stimulant properties exhibited in the healthy man, the drug has been too largely applied with the final result overriding the specific indications and a perfect ignoring of the manner of perfecting the phenomena.

Empirical observation in the recognition of the good and harmful influences, the short duration of the effects, and the increased exhalation of ammonia following its administration, has somewhat militated against error and vaguely pointed toward the true physiological process. But as these important instructions have been scattered and their importance neglected, even in the bulk of our standard text-books, an improper use of this valuable drug is still extensively exercised.

In conclusion, I therefore submit the exploded digestive changes (which seem as firmly rooted in experience as in experiment) to be the explanation of its mode of action and the reliable data to govern its administration.

ARTICLE XV.

CASE OF SUPPOSED SPONTANEOUS ANEURISM OF THE POSTERIOR TIBIAL ARTERY. LIGATURE OF FEMORAL. INCISION INTO SAC ONE MONTH AFTER, FOLLOWED BY SERIOUS HEMORRHAGE. AMPUTATION THROUGH THE THIGH. RECOVERY. ALSO. A RÉSUMÉ OF THE LITERATURE OF THE SUBJECT. By R. A. KINLOCH, M.D., Professor of Surgery in the Medical College of the State of South Carolina, Charleston, S. C. (Read at meeting of the Amer. Surg. Association, Sept. 1881.)

CASE.—J. W. R., white, adult, aged 45, coming to me from the interior of the State, was placed in the surgical ward of the City Hospital on the 20th of June, 1880. On examination he presented a disease of left leg, the limb being so large posteriorly from knee to ankle as to give the

¹ Vol. xx. page 320.

appearance of an enormous tumour springing from the posterior surface of the bones. There was besides much general œdema of the member. The limb was semi-flexed, quite warm to the touch, and very painful. The following were the dimensions of the leg below the knee: Greatest circumference $22\frac{3}{4}$ inches; circumference close to popliteal space 19 inches; diameter near ankle $14\frac{1}{4}$ inches; normal leg, greatest circumference 15 inches.

There was no history of injury to part. The only recollection of any accident suggesting traumatism was of having been thrown from a wagon six or more years ago. There was no injury to limb at that time. Three years ago trouble with the leg began, without known provocation, in the form of a "small hard lump," in the upper portion of the calf. This increased very slowly, and had at one time, he thought, some pulsation.

The great and rapid development had been during the last seven months. The helplessness and pain of the limb had induced him finally to seek advice. At the suggestion of Dr. Johnson, of Walhalla, he had come to Charleston to be under my care. Dr. Johnson had not watched the case for any time, but six months previously he had attended the man for an erysipelatous condition of the leg threatening suppuration, and subsequently he regarded the disease as aneurismal, and treated it with bandage and tourniquet without result. There remained some doubt in his mind as to correctness of diagnosis.

Tumour was semi-solid, elastic and indistinctly fluctuating to the touch, smooth, not lobulated. The tegumentary surface was congested and of a dusky bluish colour. There were large subcutaneous veins distinctly visible stretching across the swelling. There was apparently no diminution of the swelling upon direct pressure, nor was the tumour influenced by interrupting the flow of blood through the femoral artery. There was no pulsation, but when the palms of the hands were made to bear firmly upon a large extent of surface at about the region of the greatest circumference of the limb, a slight upheaving, or rather an excentric movement of the mass, was recognized. This was not perceived when the flow through the femoral was cut off by pressure at the groin. There was no *bruit*, that I could discover, although, one of my young friends thought that he recognized such. There was a trifling enlargement of some of the lymphatic glands in the groin of the affected side. The appearance of patient was healthy; body spare; countenance indicating care and suffering; there was nothing expressive of so-called malignant cachexia. He slept badly at night because of pain in the limb; his appetite was defective; his pulse quickened.

Diagnosis.—Aneurism most probably of posterior tibial artery, or possibly of lower portion of popliteal, recently become diffusive or false, sac filled with fibrin and coagula. Many of my medical friends examined the case, and the majority of them entertained serious doubts as to the correctness of this diagnosis. Opinions varied as to the existence of an encephaloid, a sarcomatous growth, a pulsating tumour of bone, etc. The time the tumour had existed, its mode of early development, its recent sudden and rapid progress, its uniform smooth surface, the excentric swelling upon removal of pressure, the character of the pain complained of, and the general condition of patient, induced confidence in my own opinion, but I could not forget how often surgeons more experienced and more capable than myself had, under similar circumstances, been led into

error. The rarity of *spontaneous* aneurism in the arteries of the leg was a strong argument, with some, against the conclusion I had reached.

In view of the suffering of the patient, and the size and condition of the supposed sac, believed to be filled with coagulum, I thought the ligation of the femoral was the most promising operation. After the ligation, I proposed to aspirate the tumour with the object of confirming the diagnosis.

Operation. Jan. 23d, 12 M. I ligated the femoral below the apex of Scarpa's triangle. Intending to use the antiseptic catgut ligature, I was at the required moment much disappointed in failing to procure a proper article; I therefore employed carbolized silk, and, as commonly done, retained one end of the thread, with which to remove the loop after the ligature had cut through the vessel. For the first time in my own experience and observation in the ligation of the femoral in the continuity, I experienced an unexpected trouble from hemorrhage. Just as I passed the needle under the vessel, there came a sudden and free gush of blood. I perceived that the bleeding was arterial, and yet could scarcely believe I had injured the main vessel either with the knife or needle. The flow was soon controlled by the finger, and by an assistant pressing the femoral at the groin. I then discovered that the hemorrhage came from a branch of the main vessel, which had been ruptured in passing the needle. This vessel I secured, then tied the main ligature to the femoral immediately below the small branch. It may be interesting to remark that this accident is alluded to by the late Mr. Syme, of Edinborough, so well known by his brilliant operations in connection with aneurismal disease. He is the only author, as far as I am aware, who mentions the fact. He says, when describing the operation on the femoral in the first edition of his *Principles of Surgery*: "The needle, though introduced with care and dexterity, sometimes occasions a pretty copious flow of blood, which fills the wound almost as rapidly as it is wiped out, but ceases upon the ligature being tied, and probably depending upon the injury of a small branch happening to come off at the part." The wound was closed by four silver wire sutures and dressed with carbolized lint, and a compress of cotton. I now aspirated the tumour, but failed to extract any more than a little bloody serum. The aspirating tube was delicate, and allowed of no free escape of the contents of the sac. The curiosity on the matter of diagnosis was thus not satisfied. Patient was put to bed and given an anodyne. The limb was wrapped in several layers of cotton wadding.

Omitting the details of my clinical notes for several days, I will only state, that the operation at once afforded some relief to the tension of the tumour, but patient was restless and slept badly after the second day.

25th. There was quite a rise in temperature (104° to 106°), and I felt that the wound could not be doing well.

26th. Removed dressing and discovered a circumscribed ovoid mulberry-coloured spot, two inches long by one wide, just below and a little to the outside of the wound made for ligating the femoral; also evidences of cellulitis extending from this point over an area of several inches to the outer and lower aspect of the thigh. There was evidently beginning gangrenous action. To meet this I made two free incisions through the diseased structures, and gave exit to a spoonful or two of putrescent fluid and some offensive gas. The lowest suture holding the wound was cut and removed, and a director introduced from this point towards the incisions just made to the outer and lower side of the thigh. Some more

offensive pus was thus liberated. After a thorough cleansing and disinfecting of the part with carbolized water, the carbolized oil dressing was reapplied. Patient was ordered quinae sulph. ℥j, opii gr. ij, twice a day. Diet, milk and bread, brandy 3j, three times a day. Wound to be dressed twice a day. Greatest circumference of limb $21\frac{1}{2}$ inches.

Feb. 1st. Patient's condition has improved. The temperature is now normal, appetite has returned, the gangrenous tissues have separated, and the cellulitis seems arrested. The greatest circumference of limb was now $20\frac{1}{2}$ inches. The general treatment had been by quinine and opium with an occasional cathartic, nutritious diet, and a moderate amount of brandy.

12th. Had continued to improve. The tumour presented about the same appearance, but the subsidence of the general œdema of the limb was more marked. I was surprised this day by a condition first discovered by one of my medical friends, who had looked in at the case, which seemed to indicate a *destruction of a portion of the inner edge of the tibia*, about three inches below the tuberosity. Through the tegumentary covering we recognized, what we believed to be, loss of substance, and there was seemingly a crescentic sharply defined excavation of the bone, one and a half inches in length. Upon slight pressure particles of bony tissue appeared to yield under the finger. I was startled by this phenomenon, and the faith in my diagnosis a little shaken. Many medical friends examined the limb, and all agreed that the bony tissue had undergone destructive absorption in connection with the growth of the tumour. Some saw in this additional support to the idea of a sarcoma, or a cancerous disease of the bone; others now regarded the case as one of osteo-aneurism. A few thought that the pressure of an aneurism proper would explain the destruction of the osseous tissue, just as has been noticed in connection with internal aneurism encroaching on the spinal column. I could scarcely believe that the pressure of an aneurism originating behind the tibia, could be sufficient to destroy the bone while the soft tissues behind the leg had yielded so freely to the growth of the tumour; nor could I understand, why, if such were the case, the inner edge merely of the bone should be destroyed, and in so restricted and precise a manner.

13th. The ligature came away this A. M. without hemorrhage. Patient's condition good. Measurement showed, however, no further diminution in size of tumour other than what might be experienced by the subsidence of the general œdema.

24th. (One month after operation.) Patient's condition unchanged. He was quite anxious to return home into the country. Consultation was held with several of my colleagues, and it was thought advisable, before consenting to patient's departure, to explore the tumour by an incision and clear up the question of diagnosis. In the event of the case being a sarcoma, or other tumour strictly of the bone, we proposed to amputate through the thigh. *If* the diagnosis of aneurism was sustained, we hoped to find the artery secure, when we could risk emptying the sac and treat this antiseptically. If the artery was permeable, we would secure it by means of a double ligature, or amputate through the thigh as a *dernier ressort*. Patient was chloroformed. I punctured the tumour close to the inner side of the tibia, and passed my index finger into the opening. There was no hemorrhage. I then enlarged the wound sufficiently to turn out the greater portion of the contents of the tumour. The aneurismal character of the disease was thus determined. I proceeded to break up and turn out the remaining layers of fibrin and blood clot. Upon feeling

for the crescentic-shaped ulceration of the tibia above described, I was amazed to find *the bone intact and smooth*. The apparent change in its structure was explained by the location, and the yielding upon pressure of the dense fibrinous layers and coagulum. The soft tissues forming the sac were thinner and softer at the point where we had imagined the bone absorbed. The tumour had evidently tended to point at this region, and the fibrinous deposit adhering closely to the inner border of the tibia, above and below the spot, had led us into error in regard to the condition of the bone. I had almost emptied the aneurismal sac, and had syringed out the immense cavity several times with carbolized water, preparatory to introducing a drainage-tube and adjusting a compress and bandage, when suddenly there came a fearful gush of arterial blood. In an instant the cavity filled. I ran my hand quickly into the sac and pressed the deeper tissue against the posterior face of the tibia, and at the same time called an assistant to press the femoral at the groin. The fearful flow was thus arrested. Carefully withdrawing my hand, I found that the pressure of the femoral commanded the bleeding. I now enlarged the opening into the sac, and endeavoured to find the point where the artery communicated. The adherent layers of fibrin and clot rendered my search futile, and I was convinced that to secure the vessel at all it could only be by ligatures *en masse*, which might include other important structures, and, most likely, *not* succeed in obliteration of the vessel, because of the supuration and gangrenous action to be subsequently encountered. A hasty consultation was held, and amputation determined on. This I practised close above the knee. Patient recovered rapidly.

April 5th. He was discharged from the hospital and returned home in good health.

Dissection (by Dr. Edw. P. Rose) proved the case to be an *aneurism* of the posterior tibial, about two inches below its origin. The artery was pervious both above and below the opening into the sac. It had been fed by collateral vessels entering the femoral below the point of ligature. The opening of the sac and the detachment of the clots and fibrinous layers had occasioned the hemorrhage.

Remarks.—The rarity of spontaneous aneurism of the vessels of the leg is well known to the profession, and readily accounted for by the size and location, together with the anatomical and physiological peculiarities of these vessels. Crisp, in his tables of 501 aneurisms, reports but two cases of aneurism of the posterior tibial. Norris, in his tables showing mortality of the ligature of the femoral, records three cases, and one of these is found in Crisp's tables. Dr. D. H. Agnew, in his recent work on surgery, alludes to having seen one case in Philadelphia in 1875, in the practice of Dr. De Forest Willard. I do not propose to go further into the opinions or experience of authorities, ancient or modern, but will record at the end of this article all of the cases of this disease I have been able to find in the limited field of research to which I have had access. But here I beg to say that I use the term *spontaneous* aneurism with some hesitancy, and simply to imply that in the cases reported there is a want of reasonable proof of origin from traumatism. I have admitted a few cases into the table with a supposed traumatic origin because I regarded

the proof of such origin insufficient and thought it best to reserve judgment. Moreover, I recognize the fact that, upon a close investigation of the history of all the admitted spontaneous or true aneurisms of the larger arteries, there is frequently found attached to this some antecedent blow or some undue exertion. Perhaps, in the strictest pathological sense, there is never a spontaneous aneurism of the posterior tibial. But practically we must take a different view of the matter.

The differential diagnosis between aneurism and other tumours, including diseased conditions of the bones, has frequently puzzled the best surgeons. In this case, perhaps, the uncertainty of diagnosis, when patient came into my hands, was as striking as in any case upon record. The deception arising from the peculiar relation of the fibrinous layers and blood clot to the border of the tibia was singularly interesting. And, lastly, the question as to the treatment pursued may be considered as a very debatable one. I regarded ligation as the promptest means for relieving the patient of his suffering. Pressure had been tried, and now its promise was too uncertain; its attendant pain or discomfort not likely to be borne. The ligation of the femoral I deemed worthy of trial, but I did not feel sanguine of its success. It was practised somewhat as an experimental procedure, and only because of the condition of the sac, as resulting from the length of time the disease had existed. The double ligature to the posterior tibial itself would have been the most thoroughly surgical operation, but in the state of the limb this could hardly have been accomplished, and most certainly not without opening the sac. Had the case been seen in its development, the double ligature of the artery would have been preferred to the Hunterian operation on the femoral.

Opening the sac I was opposed to as a primary operation. As a general rule too, surgeons are agreed upon not opening the sac after the use of the ligature. I ventured, for reasons given above, to depart from this rule a month after I had applied the ligature. The question may be asked if this practice did not cost the man his limb? Or if a cure would have resulted had the sac not been interfered with? I incline to the belief that there would have been no cure; that the full establishment of the collateral circulation would have brought renewed trouble and progressive disease. The dissection proved that the artery was pervious above and below the sac, and that it received abundant supply of blood. It was but a matter of time when there would have been demanded either amputation or the old operation of Antyllus.

Cases of Spontaneous Aneurism of the Posterior Tibial Artery.

No.	Date.	Sex and age.	Authority.	Reporter.	Treatment.	Result.	Remarks.
1	Feb. 1816	..	Med. Chir. Trans., vol. vii. (Norris)	Travers	Ligature of femoral.	Death on 7th day.	Ligature separated on fifth day, and patient died of <i>hemorrhage</i> on the 7th day.
2	Aug. 1817	Male, 27	Dub. Journ. M. & C. Sci., 1835-6, viii. p. 241.	Browne	Ligature of femoral; 2 ligatures used.	Death 41st day.	Formation of sinus along course of the sartorius muscle.
3	Aug. 1830	Male, 59	New York Med. Jour., 1830-1, i. p. 260.	Post	Amputation of thigh.	Death 7th Sept.	Dr. Cheeseman, operator; mortification of foot Aug. 20.
4	Nov. 1830	Male, 49	Med. Gaz. Lond., 1831, viii. p. 635.	Key	Ligature of femoral.	Gangrene; death.	
5	Sept. 1832	..	South's Trans. of Chelius, vol. ii. p. 543.	Green	Ligature of femoral.	Cured.	Had a fall down stairs 12 mos. previous; pulsation of leg noticed 6 months after this, and posterior tibial did not pulsate at the ankle. This may, with doubtful propriety, be classed as <i>spontaneous aneurism</i> . Ligature separated on 39th day. Two months after operation the leg had only diminished an inch in circumference.
6	1833	..	Prov. Med. and Surg. Jour., 1833 (Crisp's Table).	Tyrell	Ligature of femoral.	Cured.	
7	Jan. 1839	Male, 48	J. Soc. Sci. Med. de Lisbon, 1839, ix. 21.	Pereira	Amputation	Recovery.	
8	Aug. 1847	Male, 35	Monthly Jour. Med. Sci., 1852, xiv. p. 368.	MacKenzie	Aneurism laid open and ligature applied above and below sac.	Cured.	Six months after operation, limb was a little curved.
9	Feb. 1851	Male, 34	Virginia Med. and Surg. Jour., 1853, i. p. 364.	Gibson	Compression by bandaging and tourniquet over the popliteal artery; limb on inclined plane.	Cured (May 9th left hospital apparently well; but leg a little stiff).	Only cause ascribed, standing in one position a long time with muscles fixed.
10	June 1852	Male, 40	New York Med. Times, 1852, i. p. 233.	Markoe	Ligature of femoral.	Death 38 days after operation.	Suppuration of sac, and peritonitis.
11	Jan. 1854	Male, 27	Tr. Path. Soc. Lond., 1853-4, vol. iii. 115.	Walton	Ligature of femoral.	Death.	May have been due to over-exertion in pushing; but he had serious disease of the <i>aortic valves</i> , which caused death.
12	Jan. 1855	Male	Bull. Soc. de Chir. de Paris, 1859, ix. p. 258.	Lagout	Ligature of femoral.	Cured; ankylosed knee and semi-flexed leg one year after.	Operator, M. Fleury. Supposed to be due to unusual exertion in pulling on boot. This not established however.
13	Aug. 1871	Male, 32	Brit. Med. Jour., 1872, i. p. 101.	Curgeen-ven	Tourniquet over femoral; elastic collodion over tumour.	Cured.	Swelling came on gradually in calf of leg four months before admission.

No.	Date.	Sex and age.	Authority.	Reporter.	Treatment.	Result.	Remarks.
14	May 1872	Male, 40	Sperim- tale Firenze 1873, xxxi. p. 345.	Landi	Compres- sion; injec- tion of ergo- tiu to tu- mour; liga- ture of femoral June 13; amputation	Death Aug. 26.	
15	Nov. 1872	Male, 30	Lancet, Lond., 1873, ii. p. 301.	Stockwell	Tourniquet to femoral and popli- teal.	Cured.	Attributed to stooping.
16	Dec. 1872	Male, 31	Lancet, Lond., 1873, ii. p. 809.	Shane	Compres- sion and ligature to femoral; gangrene; amputation	Recovery	Left hospital July 22, 1873, with good stump; no heart disease. Supposed stamp- ing with foot caused disease.
17	1873	Male, 19	Dub. Jour. Med. Sci., June 1, 1877, vol. lxiii.	Richardson	Digital com- pression 154 hours, and then instru- mental com- pression 115 days before cessation of pulsation.	Cured.	This patient had had a swell- ed leg and pain in sole of foot for two years previous. Twelve months before ad- mission to hospital had been kicked on tuberosity of right tibia. Only ten weeks be- fore pain began unaccount- ably in right leg and foot, followed by swelling at seat of disease.
18	April 1874	Male, 24	Liguria Med. Genoa, 1874, xiv. p. 404.	Arata	Compres- sion; liga- ture of femoral	Partial cure of right tibial tumour.	Ant. and post. tibial involved —two tumours. Casenot re- ported as finished.
19	July 1875	Male, 66	Phil. Med. Times, 1874-5, v. p. 821.	Willard	Pressure on femoral in Scarpa's triangle.	.....	Case of fusiform aneurism of ant. and post. tibial. Aneu- rism cured, but patient had kidney disease, which was progressing to a fatal termi- nation.
20	1878	Male, 63	Med. Rec., N. Y., 1878, xiii. p. 318.	Crin	Compres- sion with Esmarch's bandage.	Cured.	Five weeks after.
21	1880	Male,	Brit. Med. Jour. Lond. 1880, i. 126.	McSwinney	Laid open by mistake; attempt to tie artery; amputation	Recovery	
22	1880	Male, 45	Trans Am. Surg. Soc.	Kinloch	Ligature of femoral; subsequent opening of sac 30 days afterward; hem'rhage; amputation through thigh.	Recovery	In the early period of the dis- ease had been treated by bandaging and the tourni- quet without good result.

Besides the above cases we notice that Mr. Erichsen, in his *Surgery*, 5th English edition, vol. ii. p. 119, alludes to a preparation of a small aneurism of the posterior tibial in the Museum of St. George's Hospital. Prof. S. D. Gross, in his treatise on *Surgery*, vol. i. p. 793, refers to a case of aneurism of the same artery as recorded by Sir Astley Cooper.

ARTICLE XVI.

A DEFENCE OF THE CÆSAREAN STATISTICS OF AMERICA. By ROBERT P. HARRIS, A.M., M.D., of Philadelphia.

IN the *Medical Times and Gazette* of April 8th, 1882, under the head of "Porro's Operation," are the following editorial remarks, page 359: "The risk of Cæsarean section is very great. Statistics are quite misleading, from the tendency of operators to publish a case if successful, but try and forget it if fatal." . . . "Dr. Harris, of Philadelphia, has got together a number of cases, from which he represents the mortality as being only twenty-five per cent., a conclusion evidently affected by the fallacy to which we have alluded."

Remarks of the same import having been repeatedly made at home and abroad, editorially, in medical societies, and to me by letter, it becomes me to set the matter at rest by a few words of explanation. It is true that operators are often inclined to keep their unsuccessful cases out of print; but that does not prevent their being obtained, if the statistical hunter is sufficiently persevering, and not easily discouraged by the amount of time and labour required. As an offset to this, it is equally true, that some of the most encouraging Cæsarean cases here and in Great Britain were withheld from publication by their operators, and not obtained until after their death. There are two ways of collecting statistics. The common and easy one is to search all the published records in books and journals, and tabulate the cases; setting down the percentage of success as an evidence of the relative standing of the particular operation in question. The other plan is to begin the real work of collecting just here, and to make a persevering search, if it takes years to accomplish it, after the unrecorded cases of the country, without the least regard to their success or failure. Many of my correspondents will bear me out in the claim, that I have made as persevering searches after fatal cases, as I have ever made after those that were the contrary. My work commenced in 1869, and I may say that in twelve years, the whole United States were very thoroughly searched over; as evidenced by the fact, that 55 unpublished cases were obtained, as an addition to 69 published ones. Had I stopped with the 69 I should have shown a mortality of only $46\frac{1}{3}$ per cent.; but the addition increased the mortality to a fraction above 57 per cent. As the record for the United States now stands, we have saved 53 out of 124 cases. The 55 unpublished cases, although adding largely to the percentage of deaths, were by no means as fatal as might have been presumed; for 16 of them recovered, or as many as were saved out of the first 100 in Radford's statistics of Great Britain.

I have never claimed that we had had a mortality of only 25 per cent. This I presume has been founded upon a statement to the effect that but

28 of the 124 operations had been performed in good season ; rated by the time in labour, and the condition of the woman when operated upon ; and that 21, or 75 per cent. of the operations, resulted in safety to the mothers. Of the 28 children, 23 were delivered alive, of whom 4 lived but a short time ; leaving 21 mothers and 19 children as the results of 28 *early* or *timely* gastro-hysterotomies.

To sum up, we have had 124 Cæsarean operations in the United States, 7 in the West Indies, and 1 in Mexico, with 60 women saved, or $45\frac{5}{11}$ per cent. in North America.

It has been a great surprise to many, who were inclined to overrate the dangers of the Cæsarean operation in the United States, to find that even the unrecorded cases presented a recovery percentage of $29\frac{1}{11}$. It is a very simple matter to decry statistics, on the ground that "all good cases are reported, and bad ones withheld ;" but such a guess has not been sustained by the facts, as shown in this record. Conscious of entire honesty in my searches after the truth, it is not very pleasant to hear remarks, which indicate a want of confidence in the thoroughness of the work as presented. I know that in tracing rumored operations to get the truth, I have rejected a large number ; that from one to five years have been expended over some cases ; and that those retained have ample evidence of reliability. My only regret is, that the corresponding work in other countries has not been done in the same manner.

The claim has been made recently, by one of our own writers, that European operators are more inclined than Americans to publish their cases. This may be true in a measure as to the present, and in particular as to Great Britain, where weekly journals are in active search for medical intelligence ; but personal experience leads me to a very different opinion as to the past, and particularly in regard to some of the continental countries. As to England herself, I have only to cite the fact that notwithstanding the Cæsarean searches made and published on three several occasions by the late Dr. Thomas Radford, of Manchester, he failed to secure the only case in his country in which the operation had been performed twice upon the same woman, although the parties resided in Sheffield, thirty-five miles distant. Had Dr. Radford sought out unrecorded cases, as I have done, through correspondents, instead of by notices in journals, he would hardly have failed to learn of the operations by the late Mr. Henry Jackson and his son. There is this difference between Dr. Radford's "*communicated*" cases and mine. His, with very few exceptions, were on the eve of publication, and mine were chiefly old lost cases, or such as there was no intention of ever reporting. Of the 55 unpublished cases, 13 were obtained after the deaths of the operators, and 9 through other physicians, either present or having knowledge of the operations.

REVIEWS.

ART. XVII.—*Etude du Processus Histologique des Néphrites*. Par la Dr. CH. HORTOLÈS, Interne des Hopitaux de Lyon, etc. 8vo, pp. 182. Paris : J. B. Bailliere et Fils, 1881.

SINCE the great work of Rayer, the contributions of French writers to the pathology of Bright's disease, have not been of great importance. In France, of late years, few, if any, studies upon this subject have appeared equal in value to those of Johnson, Dickinson, Grainger Stewart, Wilks, and Gull and Sutton among English writers, and of Virchow, Reinhardt, Frerichs, Bartels, and Weigert among German writers.

The work of Hortolès treats of the histological changes met with in acute and chronic nephritis, particularly in the different forms of Bright's disease. His investigations were conducted under Renaut's direction in the laboratory of general anatomy in the medical school at Lyons. They are, therefore, in the spirit of the modern French school of histology, which owes its excellent methods and results in greatest part to Ranvier. Hortolès work, however, suffers from a defect only too commonly met with in French scientific productions, namely, ignorance of results obtained in the same field of study by investigators in other countries. It is owing to this reproach that in some instances the author puts forward as discoveries facts already established, and, on the other hand, sometimes treats slightly or not at all important points in controversy. His work, however, is valuable as it embodies original and careful investigations upon a most important subject. It treats professedly only of the histological details of the lesions produced in inflamed kidneys, and does not discuss from a general point of view the pathological anatomy of Bright's disease. The careful histological study of the renal lesions of Bright's disease has led Hortolès, as well as many other recent observers, to the view that the current classifications of this disease are based upon erroneous pathological conceptions. This relates more particularly to the sharp distinction usually drawn between the parenchymatous and the interstitial forms of Bright's disease, and to the propriety of regarding purely parenchymatous changes as inflammatory.

After a brief introductory chapter devoted chiefly to a historical review of the divergent views, relating to the nature and extent of the interstitial and parenchymatous changes in nephritis, the writer gives the results of his studies upon certain disputed points in the *normal histology* of the kidneys. Taking up first the structure of the glomeruli, he notes that in the simplest forms of kidney, as in the lamprey, there exists fully developed fibrillated connective tissue between the glomerular capillaries, and that the whole glomerulus is surrounded by a layer of endothelial cells. In man he regards the cells which lie over and between the capillaries of the glomerulus as connective-tissue cells, and as all that remains of the fully-developed connective tissue found in the glomeruli of the lamprey.

These cells are thin and branching, and comparable to similar cells found around capillaries in other parts of the body (*couche rameuse perivasculaire* of Renaut). The epithelium which covers the glomerulus in early fetal life is not found after birth. The author is at much pains to show that the walls of the capillaries in the glomerulus do not present the usual endothelial markings after injecting them with nitrate of silver, a fact which had previously been established. Hortolès is unable to demonstrate the existence of lymphatic vessels or of lymph-spaces, lined by endothelium, in the parenchyma of the kidney. He notes the presence of a single layer of smooth muscular fibres around the efferent vessel of the glomerulus, and signalizes the absence of any muscular coat in the interlobular veins. Adducing Heidenhain's observations, he calls attention to the highly differentiated character of the epithelium lining the convoluted tubes, which, like other highly organized cells, such as nerve-cells, muscle-fibres, etc., responds to the action of inflammatory irritants, not by proliferation, but by degeneration and death. He believes that Cornil has falsely interpreted the hyaline drops (*sarcodic excrescences*), which often exude from these cells after death, as evidence that they give origin to the material of hyaline casts.

Hortolès describes three forms of *acute inflammation* of the kidneys. To these he gives the names, acute congestive œdema of the kidney or congestive nephritis, phlegmonous œdema of the kidney or phlegmonous nephritis, and acute catarrhal œdema of the kidney or mixed catarrhal nephritis. This application of the term œdema to various forms of inflammation is contrary to English, and, in fact, to general usage, and cannot be considered a happy choice. Indeed, many of the expressions and views which the author emits from place to place concerning inflammation in general are singularly crude. Thus, in the process which he calls acute-congestive œdema, he says that emigration of white blood-corpuscles does not constitute inflammation unless the fixed cells proliferate, this latter change only distinguishing the process from passive œdema. In true congestive inflammations the walls of the vessels must soften and give rise to a genuine hemorrhage! In phlegmonous inflammations the embryonic cells finally "die and are transformed into pus globules!" Emigration of white blood-corpuscles he refers to increased blood-pressure.

The type of acute congestive œdema of the kidney is *scarlatinal nephritis*. The main element in this process is emigration of white blood-corpuscles from the intertubular capillaries. Hortolès, therefore, is in harmony with many recent observers in considering scarlatinal nephritis rather as interstitial than as parenchymatous nephritis. The following are among the noteworthy features in his description of the pathological histology of scarlatinal nephritis. The emigration begins in the periphery of the renal lobules and gradually extends to the medullary ray in the centre. No emigration takes place from the capillaries of the glomeruli as their peculiar structure does not permit it. The albumen and blood-corpuscles which appear in the urine are derived from the capillaries between the tubes, particularly between the collecting tubes, and not from the glomeruli. White blood-corpuscles accumulate within the capillaries of the glomeruli and obstruct the circulation in them, thus causing diminished secretion of urine. This accumulation of white blood-corpuscles was mistaken by Klebs for an increase of intercapillary nuclei, and therefore interpreted by him as a true glomerulitis, which does not occur. Casts are rarely found in the tubes. The epithelium of the tubes rarely under-

goes any marked change, there being at the most a moderate swelling and increased cloudiness of the capsular epithelium and epithelium of the convoluted tubes. The scanty connective-tissue cells between the straight tubes swell up, become granular and proliferate. The usual termination of the process is in resolution, which occurs with great ease and rapidity, the embryonic cells being rapidly swept out of the kidney by the lymph-current. Exceptionally the termination is in chronic nephritis, in which case the young cells give origin to connective tissue, and many glomeruli become obliterated.

It cannot be said that Hortolès establishes all of these points. Particularly unsatisfactory is his treatment of the changes in the glomeruli in this, as well as in the other forms of nephritis. He seems to be acquainted only with the older observations of Klebs, and to be ignorant of the more recent interesting studies of Langhans and Ribbert upon glomerulitis. He in no way proves that albumen does not escape from the glomerular capillaries in scarlatinal nephritis.

Phlegmonous nephritis and the renal changes in *leucocythæmia* are described chiefly in order to contrast the behaviour of the emigrated white blood-corpuscles in these conditions with that in congestive nephritis. Phlegmonous nephritis is distinguishable from congestive nephritis by the circumscribed character of the inflammation, by the exudation of fibrin, and by suppuration. In leucocythæmia the exuded white corpuscles become separated from each other by the development of a reticulated stroma.

The next form of acute nephritis considered is *mixed catarrhal nephritis*, the type of which is the renal inflammation which sometimes occurs in the second and third weeks of typhoid fever. The histological elements which characterize this form of nephritis are, *a*, desquamation and proliferation of the epithelium of the collecting tubes and of the tubes of Henle (catarrh of the tubes), *b*, swelling, granular degeneration, and loss of nuclei of the epithelium of the convoluted tubes, *c*, a moderate emigration of white blood-corpuscles in the periphery of the lobules, *d*, an abundant exudation of an albuminous fluid from the glomeruli, which fills the tubes, escapes into the intertubular spaces, and is often absorbed by the veins. Three kinds of casts are met with in the urine. The hyaline casts result from coagulation within the tubes of the albuminous fluid which exudes from the glomeruli. The nucleated epithelial casts are indicative of catarrh of the straight tubes of whose desquamated epithelium they are formed. The granular casts (which may become fatty by action of the urine on the granular material) are derived from the degenerated granular cells of the convoluted tubes. The changes in the epithelium of the convoluted tubes, to which changes the name parenchymatous inflammation has hitherto been applied, are purely degenerative, and not inflammatory. "The term parenchymatous nephritis should be banished from pathologico-anatomical nomenclature," says our author. Especial emphasis is laid upon the abundant exudation from the glomeruli of an albuminous material, which coagulates in a hyaline form within Bowman's capsules, in and between the tubes, and within the veins. This albuminous oedema, as the author calls it, is entirely different from congestive as well as from passive oedema. Emigration of white blood-corpuscles always occurs in this form of nephritis, but is much less in degree and extent than in scarlatinal nephritis. In this form there is no blocking up of the capillaries of the glomerulus by white blood-corpuscles. If the disease lasts two or

three weeks new connective tissue is produced. This is formed from the embryonic cells. With considerable detail is described the growth of new connective tissue in islands composed of the colloid or hyaline substance described above as resulting from the coagulation of the albumen filtered from the glomeruli. These colloid foci constitute the "myxoid points" of Renaut. The embryonic cells inclosed within them become stellate and anastomose with each other, thus producing mucoid tissue, which then develops into ordinary fibrillated connective tissue. This formation of connective tissue in myxoid points occurs, not only between the tubes, but also within the tubes and within Bowman's capsules. The same process can be studied in chronic nephritis. An exaggerated form of this variety of nephritis may be called the eclamptic form. With it there is a rapid development of severe uræmic symptoms. It is characterized anatomically by an enormous exudation of the coagulable albuminous fluid from the glomeruli, so that the kidney is fairly inundated by it, and the circulation through it is checked. This form of typhoid nephritis has been described by Renaut.

In criticism of Hortolès's views concerning the two forms of acute Bright's disease which he describes, it must be said that few will be inclined to accept the sharp distinctions which he draws between what he terms congestive nephritis and mixed catarrhal nephritis. The hyaline exudation in, and sometimes between, the tubes is confined to no particular form of nephritis. While it is true that in some cases epithelial changes are extensive and emigration scanty, while in others there is abundant emigration with little alteration in the epithelium, these facts cannot serve as a basis of useful classification of acute Bright's disease, for there may be every possible degree of combination as regards the relative proportion of the epithelial changes, and the emigration of white corpuscles. From the great attention which has been paid to typhoid nephritis in France, this complication of typhoid fever would seem to be more common in that country than with us, and Hortolès's observations must be considered a valuable contribution to our knowledge of its pathological histology. Concerning the development of mucoid tissue in the hyaline albuminous exudation one cannot help thinking that the peculiar shapes which wandering cells may assume in a colloid medium may have been mistaken for developing connective-tissue cells. This suspicion is increased by the assertions as to the development of this tissue in the interior of the tubes, and even in ovarian and other cysts with colloid contents.

A chapter is devoted to the consideration of the alterations which the kidneys undergo in consequence of the passive congestion resulting from heart disease. The *cardiac œdematous* kidney is the name under which these changes are embraced. They consist in catarrh of the straight tubes, in degeneration of the epithelium of the convoluted tubes, in the exudation of coagulable albuminous fluid from the glomeruli, in emigration of white blood-corpuscles, and in the new formation of mucoid and fibrillated connective tissue. The pyramidal substance is said to be more affected than the cortical. The examination of a single case has served Hortolès as the basis of his description of the changes induced by chronic passive congestion of the kidneys. His general conclusions, therefore, are unsupported by sufficient evidence, and are of little weight. A wider experience would have taught him that chronic passive congestion of the kidneys in cardiac diseases may exist for a long time without producing inflammation of these organs.

In the remaining chapters are described the lesions of *chronic nephritis*, and these are followed by a *résumé* of the general conclusions arrived at by the author. In chronic nephritis the development of new connective tissue plays an important role, although epithelial changes are never absent. Hortolès believes that the fibrous tissue of chronic nephritis is formed not out of granulation tissue, but out of mucoid tissue. A "mucoid stage" precedes the stage of fibrous atrophy of the kidney. The mucoid tissue is formed mainly by proliferation of connective-tissue cells, although emigrated white corpuscles may have some share in its production. He describes three modes of obliteration of the Malpighian tufts; *a*, by gradual thickening of the capsule of Bowman, accompanied by fatty degeneration of the glomerular capillaries; *b*, by the same thickening accompanied by hyaline or colloid exudation within the capsule, and consequent compression of the glomerulus; *c*, by the development of fibrous tissue from the cells surrounding the capillaries of the glomerulus, a true glomerulitis. Changes in the coats of the branches of the renal arteries are of predominant importance in some forms of chronic nephritis, particularly in that accompanying lead poisoning, and in that attendant upon atheroma of the arteries. These changes are thickening of the adventitia (periarteritis), and thickening of the intima (endarteritis obliterans). In the smaller arteries the thickened intima may present a hyaline appearance, and a similar hyaline transformation may occur in the capillaries of the glomerulus. Nothing is said concerning changes in the arteries in other parts of the body. The membranæ propriæ of the tubes become hypertrophied. The epithelium in those tubes which are surrounded by newly formed fibrous tissue is atrophied, but possesses nuclei which stain deeply. On the other hand, the epithelium of other tubes is swollen and often without nuclei capable of being stained. Concerning the atrophy of tubes and the formation of cysts the author has nothing new to offer. The same catarrhal and degenerative changes in the epithelium, which have been described in connection with acute nephritis, are also present in the chronic forms.

With the exception of the role assigned by Hortolès to the development of mucoid tissue, there is not much new in his account of the histological lesions of chronic nephritis, and it may well be doubted whether mucoid tissue is to be found with the constancy and to the extent described by the author.

In conclusion may be quoted his statement concerning parenchymatous and interstitial nephritis.

"If the name parenchymatous nephritis be given to the morbid process characterized by cloudy swelling of the striated epithelium, and its local death as indicated by impossibility of nuclear staining, and if, on the other hand, the name interstitial nephritis be applied to the inflammatory changes in the intertubular spaces, one can boldly assert that parenchymatous nephritis, as well as interstitial nephritis, does not exist as an isolated state, but that the two forms of lesion are always united in the same diseased kidney" (page 124).

The work is accompanied by five beautifully and faithfully executed chromo-lithographic plates, representing drawings from microscopical sections of diseased kidneys.

W. H. W.

ART. XVIII.—*Recent Works on the Diseases of Women.*

1. *Diseases of Women, including their Pathology, Causation, Symptoms, Diagnosis, and Treatment. A Manual for Students and Practitioners.* By ARTHUR W. EDIS, M.D. Lond., F.R.C.P., M.R.C.S. With One Hundred and Forty-eight Illustrations. Philadelphia: Henry C. Lea's Son & Co., 1882.
2. *A Clinical Hand-Book on the Diseases of Women.* By W. SYMINGTON BROWN, M.D., Member of the Gynecological Society of Boston, etc. New York: William Wood & Company, 1882.

THE two volumes, the titles of which are at the head of this article, stand at the opposite poles of book-making. The fact that they are upon kindred subjects, and both written for the same class of readers, serves but to illuminate the positive merits of the one, and the negative merits of the other. At the first glance, in view of the overburdened state of gynecic literature, we cannot help feeling some regret that Dr. Edis should feel obliged to write a book upon the diseases of women. But, if we are compelled to submit to the infliction of Dr. Brown's book—and we evidently cannot help ourselves—there is no better, or more welcome remedy, than a good one like that of Dr. Edis.

It is a fact, not at all unusual, that both the volumes are written for the student and junior, or general practitioner, and it certainly does not reflect credit upon the authors, that this fact is stated in an apologetic way in the prefaces. While we feel able to realize the character and age of the general practitioner—"country practitioner," Dr. Brown calls him—we must confess a doubt as to the same qualities in the student for whom the volumes are written. After reading Dr. Brown's work, it is clear as to the character of his students; but we fancy that Dr. Edis includes under that generic term, all the gynecologists, and especially all the ovariologists. It is necessary to make but one quotation to prove this. "The diagnosis of abdominal tumors being generally one of much difficulty to the student," etc. Now, we would like to know, when that period of life ceases, and the illuminated moment comes to the gynecologist when the abdominal diagnosis is easy.

The arrangement of Dr. Edis's book is logical, and naturally results from a systematic study of the parts. In this natural order we have malformations of the uterus, followed by displacements, and to the latter are given four excellent chapters. Following in the order given, we have chapters on functional disturbances in circulation of the uterus, inflammation in its various degrees and forms, benign tissue changes in uterine texture, new growths, malignant diseases. Next in order come the ovaries, to which four chapters, amounting to about one-fifth of the volume, are given. The uterine appendages, aside from the ovaries, including extra-uterine pregnancy, are next in order, followed by a consideration of the disorders of the vulva and vagina in separate chapters. Purely functional disorders, among which the author classes amenorrhœa, chlorosis, and vicarious menstruation, form a suitable close to the systematic portion of the book. The remaining part of the volume, consisting of eight chapters, is rather faulty in the grouping of subjects. In view of the elementary character of the greater part of the work, it would have given the student a more scientific idea of dysmenorrhœa, leucorrhœa, uterine hemorrhage, menorrhagia, and metrorrhagia, not to have given these symptoms

separate chapters; but considered them in connection with the diseases of which they were symptoms. Leucorrhœa and uterine hemorrhage are not diseased entities, but are symptoms merely, and must be so understood if they are to be properly treated. Whenever they are considered in a text-book, separate from their morbid antecedents, the latter is in danger of being overlooked.

Upon the subject of displacements, the author gives a striking illustration of the value of oblique facts, as Czermak calls them. The false is as good as the true, so long as it passes current. Speaking of anteversion, the author says that the "normal position of the uterus corresponds with the axis of the pelvic brim. The uterus occupies as near as possible the centre of the upper part of the pelvic cavity, being suspended between the rectum and bladder, about midway between symphysis pubis and the sacrum." Such a sentence in a new text-book designed to form the after-coming gynecological opinion and practice is enough to discourage every earnest worker. Yet, there are reasons for hope. We well remember certain other matters which have had to struggle their way through to the light. In our early battle for the intra-uterine stem, a very temperate clinical article was declined by a New York journal, because such practice was dangerous in the hands of the general practitioner in the opinion of the editor. What was then doubtful is now legitimate. The uterus never was, and never will be found in the position described by Dr. Edis as the normal. There is now a very rich literature upon this subject, and Dr. Edis, and all others, ought to inform themselves relating to it before they write upon the subject. The author uses the term congenital in relation to uterine malpositions. The best usage condemns this use of the word. The human female is not born with a uterus as we know it in the adult; in fact, it may be said not to exist. For a displacement, therefore, to be congenital is impossible. Dr. Edis's position in regard to the use and indications of the intra-uterine stem, is a sensible and practical one, and affords an excellent example to some American authors. For cervical antelexion, the plan to incise the posterior wall is advised, which we believe is not the better way to treat it. It is dangerous, and does not always cure.

In the treatment of hypertrophic elongation of the cervix, no consideration is given to telescopic elongation of the supra-vaginal neck, thus simulating true infra-vaginal elongation. Amputation is strongly advised, differing somewhat from the American method. Upon the subject of laceration of the cervix uteri, we are pleased to notice that Dr. Edis quotes Simpson with approval to the effect that this injury is not the result of mismanagement in labour. He thus sets a worthy example to many American teachers, who are satisfied with this unscientific explanation of the accident. In a concise paragraph he enumerates the various causes that may contribute to this injury, which will tend to do away with false notions regarding its causation. The after-treatment of the operation is not such as experience has taught us is necessary. Confinement in bed for ten days or two weeks, and a low diet, as well as directing the patient to pass water by turning upon her hands and knees, are uncalled-for refinements. On the contrary, the patient may be allowed to walk about her room, have a full diet, and in the case of repair of slight lacerations, she may be permitted to ride out. The moral effect of this is very great, as, in many cases, women who are in great need of the operation will refuse through dread of the confinement. The various chapters upon ute-

rine inflammation, are rich in prescriptions adapted to the conditions described. Some of them are quite complicated, and have a sort of Fothergill flavour in the number of their components; their chief fault, however, is in the large number offered for the choice of the reader. It strikes us as a better plan to detail the treatment in a general way, and let the student do his own compounding. In no other way can the student be taught the thorough mastery of his remedies that will make him a skilful prescriber.

Nothing that we have ever read is better in its way and purpose than the chapters upon ovarian tumour and diagnosis of abdominal tumours. The plan of arrangement is excellent, and the matter admirably condensed, giving the reader the matter of a whole volume upon this special subject. But what drew our attention at the first glance was the very fine writing exhibited, showing that Dr. Edis possesses descriptive powers of a high order. We are tempted to give the reader the benefit of a paragraph. He is speaking of the vascular system of an ovarian cyst. "The vessels supplying the tumour enter at its base, enlarge with its growth, and ramify very freely on its inner surface. They form a complete network in and under the peritoneum; and the capillaries passing into the fibrous layer traverse it, and have a peculiar arrangement on the inside, where they form knots of anastomosis, with bulbous dilatations and terminal pouches, like, but less regular than, those found in the chorion. Outside, under the peritoneal covering, numerous large and tortuous veins may be traced plainly. Nerves pass with the vessels into the substance of the coats and lymphatics, often of large size." We do not know of a more vivid description to be found in modern medical writings.

With excellent judgment the author has introduced a chapter upon extra-uterine gestation, somewhat of an innovation in works upon the diseases of women; but, as the author has managed it, of great practical value. In this he has set an example, which, we doubt not, every coming writer in this department will follow. In this chapter Dr. Parry's work lives after him in the cordial appreciation of Dr. Edis.

In the sections upon plastic operations, the various procedures are well described and illustrated, with the exception of Dr. Tait's, in which the description is very meagre, and the wood-cut of no value. As Dr. Tait's operation for the repair of the female perineum is difficult to understand from a mere description, and as it affords some great advantages to the patient, it ought to be freely illustrated. In the description of vesicovaginal fistula the operation figured is that of Simon. For English readers this is an improvement, as the method of Simon gives better promise of success, especially to the novice, than the American operation. Indeed, following the method of Sims or Emmet, gives the most uncertain results of any gynecological operation to the beginner, and nothing but the constant example of the inimitable skill of these great operators has kept the method in use to the exclusion of more scientific procedures among us.

In the chapter upon hysteria, we have nerve tire, or neurosthenia, which gives Dr. Edis occasion for a long quotation from Mitchell upon his milk treatment. This treatment has drawn to itself marked attention in England. Several years ago, Dr. Graily Hewitt invited the reviewer to meet him at a small hospital in Gower Street—his "flexion hospital," as he called it, in which he was employing a system of rest and forced feeding, similar to Dr. Mitchell's plan, with the exception of massage and electricity. He seemed quite elated with his results, and generally exhibited them to his medical visitors. Near the conclusion of the volume we have

a chapter of ten pages upon diseases of the bladder, which is the most unsatisfactory part of the work. It is too briefly written to be of much practical value, and yet the subject is one of greater importance to the general practitioner than any other in gynecological practice.

Dr. Edis's book does not go beyond the current ideas of etiology, pathology, and treatment. He has made no attempt to garner in the permanent form of the treatise the rich harvest of the special journals. Each author ought, however, to contribute his share to this work. The store of material is so great, that, going over the great field of gynecology, as the author of a text-book does, it is scarcely within the reach of one busy, hard-worked physician; it must, therefore, be the work of several hands, a division of labour, and very possibly a division of interest also.

2. It is a very difficult thing to understand for whom Dr. Brown wrote his *Clinical Handbook on the Diseases of Women*; judging from his preface, which is modest in its disclaimer of originality, "it is intended as a guide for the use of medical students and country practitioners," but, judged from its make-up and matter, there is no class of people in any way related to the medical profession to whom the book could be of any use. There are two pages of dictionary, in which such words as "clap," "onanism," "vulsellum," and others find place in connection with many obsolete terms. He naively describes the mammary glands as situated over the pectoral muscles, the "nipple, placed in the centre of the gland, lies opposite the fourth rib, and is surrounded by a rose-pink ring." He describes the bulb of the vagina as situated in the "upper vaginal wall near the entrance," and that it has been mistaken sometimes "for the womb." We looked with some anxiety to see if he had described the rectum with reference to a very possible mistake, which the "country practitioner" ought to be guarded against, and found that he had neglected a very manifest duty. He directs the benighted rural individual, for whom the book is written, to examine his patient upon a kitchen table, "three inches lower at the end where the patient's head lies," and then, with the aid of a little domestic upholstery, "you have an arrangement which can scarcely be improved upon." Before sitting down comfortably to examine his patient, the doctor is directed to wash his hands, and then, seated at the end of the table, we suppose, some distance lower than his patient, the left index finger explores the vagina, while the right hand makes steady pressure over what the author terms the "pubis." This, he informs us, with the dignity of italics, is called bi-manual palpation, and tells the student in four lines all that this manipulation will teach him, which we think is space enough; but, with malice directed against the peace of every inquiring mind, he tells us that it will teach "many other points only to be learned by experience." We regret to say that he neglects to direct the doctor to wash his hands at the conclusion of his examination. Now the reader may regard this last remark as a hypercriticism, and as really unkind to a not undeserving author; but if, from the above, the reader has caught an idea of how elementary the book is, that it teaches the alphabet of the easy, yet so difficult, art of gynecology, and to implant in the ancient, bucolic mind a new idea, a difficult thing to do we fancy in the opinion of Dr. Brown, the reader will perceive that the omission noticed by the reviewer is a very serious matter. In this sin of omission, touching the subject of cleanliness, *after* an examination, Dr. Brown has very good company. You might trust a bright student to his wits very

safely about making an examination, but he ought not to be trusted uninformed about protecting himself after he had completed his operation. Can the reader point out a single book where this subject is given the importance it deserves? If a gynecologist cannot afford any other religion, he will do very well if he be as near to Godliness as thorough cleanliness will make him.

Philosophically considered there are no such things as dirt and filth. They both have their place, and use, and eternal fitness. In this sense we exclude all idea of uncleanness in the practice of the art of gynecology. We have thus cleared the way for the assertion that the practice of gynecology may be made, of all earthly employments, the most filthy. But this exists in the operator, not in the subject, or the spontaneous condition of the subject. Many methods of treatment deliberately followed by physicians are, from their nature, filthy. We know a very good man, if not much of a gynecologist, who always inserts a piece of sponge to retain a displaced uterus in position. The point, however, to which we wish to direct the attention of the reader, is the care of the instruments and hands. The hand of the gynecologist is a peculiar organ. It is the hand of the physician plus a certain spiritual quality that renders it subservient to the highest use to which the sense of touch can be applied; and in its full perfection, like the brain of the poet, is born, not made. It is not as a scientific organ that we wish to speak of it; but as a channel for infection to the owner. This has already become a serious matter. American gynecology can count a small battalion of victims, dead or maimed. Storer, of Boston, lost years of his valuable life; Thomas, of New York, had a narrow escape; Engleman, of St. Louis, has a deformed hand, with his vitality hardly yet recovered from the shock. Armsby, of Albany, carried to the grave a maimed hand, with his health shattered beyond repair; Dean, of Rochester, lost his life; and we might go on through half a page with the enumeration of these accidents. These are all cases of septic infection. And we look upon it very much as though it was a case of typhus fever which had occurred in a physician's household, something that ought to be avoided, and a disgrace because it was not. In this age, when all surgery and half of medicine are turning upon the germ theory, the person of a surgeon ought to be protected by scientific forethought and personal hygiene, for the sake of the example, if for nothing else. A matter of first importance is the care of the finger-nails and fingers; and this is not the care given to these parts by gentlemen and ladies. Fashion teaches that the skin should be forced back over the matrix of the nail, so that the small semilunar rim will show at the base of the nail, thus giving it an almond shape. This, on the contrary, the gynecologist ought to allow to grow firmly upon the nail, interposing a firm shield against the entrance of infecting material under the quick, as it is commonly called. "Hang-nails" ought never to be allowed to form, and they may be prevented by keeping the skin soft and firm. Nothing promotes a healthy skin so well as sunlight; the well-browned hand of a man, not a labourer, is seen to be soft, firm, and non-absorbent. The specialist ought not to wear gloves in summer time, except a light cotton glove, for the purpose of keeping his hands clean; or, if he drives himself, under no consideration ought he to wear gloves that will sweat the hands. These are not the rules to form a dainty hand, but the young gynecologist must understand that women go to him professionally, because they are obliged to, not because of the fit of his clothes, or the beauty of his hands.

And this part of our digression brings us back to the pleasant task of reviewing Dr. Brown's book. He tells the student to lubricate his fingers with soap and water before making an examination, and we have noticed the same direction in other hand-books. The exploring finger is lubricated for two purposes; first, to facilitate its introduction, and lastly, to protect the finger from the many forms of infection to which it is exposed. Soap and water may answer the first purpose in a very imperfect manner, but it is useless for the latter. It is quite common to use cosmoline or vaseline for this purpose; but we have noticed that the frequent use of these lubricants causes the skin to flake up and become rough. Oils are faulty, because they are liable to drip upon the clothing or floor, and lard at some seasons is too hard and liable to become rancid. A mixture of about one-third olive oil and two-thirds lard, with two per cent. of carbolic acid or oil of thyme, makes a cheap and reliable lubricant. The conditions to be met are, a material sufficiently firm and consistent as not to rub off the fingers, fluid enough to lubricate, and furnished with some unirritating antiseptic. Next, and this for the sake of the patient, comes the care of the instruments. About this Dr. Brown does not say anything, and, as for that matter, neither does Dr. Edis, or Dr. Thomas, or Dr. Emmet, or even Dr. Mundé; but the instruments require a special hygiene that is never for a moment relaxed. The expensive instruments, and those used in great operations, are, of course, properly taken care of, but the every-day instruments are those which may become dangerous to the patient. Now all this is a very serious matter, especially as we are reviewing this book for the sake of the student and country practitioner, for whom it is written, we feel obliged to tell them that it is a matter of dollars and cents. It has happened to us that a lady has applied for treatment, giving as an excuse for leaving her physician, a very worthy man, and one in whom she had great confidence, that his instruments were so filthy that she dared not trust herself in his hands any longer.

Cleanliness is a very simple matter; there is but one element in it, ceaseless watchfulness. It must be looked after to-day, to-morrow, always. In nothing is this more true than in gynecology, in which a physician may do more harm by his carelessness than he can do good by his treatment. Naturally, he uses the same lubricant for his instruments that he does for his hands, and both as a matter of course and convenience the same means are used to clean both hands and appliances. For this purpose nothing is equal to good yellow soap, kitchen soap, for the reason that it removes oily matter and other forms of impurity more quickly than any fancy or toilet soap that we have ever used, the hands are exposed to water for a shorter time, and are thus less liable to crack or chaf. Since this hitherto unwritten chapter of gynecology is now disposed of, we can resume the thread of our review.

As Dr. Brown's book is not only a hand-book, but a clinical hand-book as well, this feature deserves some attention. A scientific hand-book is a short practical *résumé* of a subject for handy reference. We have a few notable instances in gynecology. Take Lombe Atthill's book, in the form of clinical lectures, which is without a peer as a hand-book. There is scarcely a formal reference to a "case" in the volume. Lawson Tait, with the finest literary art, blends any special application of a principle to a case so unobtrusively with the text, that the reader feels that no time is lost in its clinical details. Such an application of the general to the special, as is usually found in the clinical text-book, is a useless burden to

the text. Like a wood-cut it can illustrate but one or two of the general principles involved, and as cases are endless in the variety of their clinical features, they serve rather to confuse the young reader than clear up an obscure point in practice. The proper place for a formal display of case histories is in the special or general periodicals; and the proper place for the general principles established by the clinician is in the treatise or hand-book.

In the clinical hand-book under review, the clinical details tend rather to obscure than to make clear the text; but if this was their only fault, we should allow that matter to pass. A large proportion of the cases which are used is borrowed, and thus lack the graphic vividness that belongs to personal experience on the part of the writer, while some of the author's own details are impossible to understand. For instance, upon the subject of leucorrhœa, he relates the case of a girl, twelve years old, whom he examined through the vagina with his little finger, and found the cause of her leucorrhœa to be a pin, which he removed from Douglas's pouch, and this he did with his little finger, even unaided by bi-manual palpation, as practised by our author. In some cases he operates through a small bivalve speculum, which is certainly bad advice to the country practitioner. As one of the means of arresting a pending abortion, he directs plugging of the vagina by iodized wool, to arrest hemorrhage; and yet, on the next page, he gives the true result of tamponing the vagina, which is to excite uterine contractions. In this operation he directs that the plug be pressed into the anterior *cul-de-sac* and into Douglas's pouch. In several other places he confounds the posterior *cul-de-sac* with the sac of Douglas.

We have given more space to the book than it deserves. We regard the volume as a dangerous one, because the author caters to a class of inexpert readers by the style, size, and price of the book. The country practitioner is a long-suffering individual, and he deserves all the protection that the reviewer can afford him against the designs of ambitious authors. The contrast between the two volumes that stand at the head of this article is a striking one. The author of one is earnest, pains-taking, learned; his book shows labour, thought, and careful revision, and is altogether a manly work, such as one should expect from an English gentleman. The other is careless in the statements of opinion and fact, a misdemeanor on the part of one who professes to be an educator, written in obscure English, teaching false anatomy and doubtful practice. The only motive of the book seems to be an outcome of the morbid desire of the author to write a book, cost what it may to his own reputation and the well-being of his readers.

E. V. de W.

ART. XIX.—*Scrofula and its Gland Diseases*. By FREDERICK TREVES, F.R.C.S. Eng., Assistant Surgeon to, and Senior Demonstrator of Anatomy at, the London Hospital. 12mo. pp. xii., 205. London: Smith, Elder & Co., 1882.

THIS is a notable contribution to medical literature for several reasons. Not only is it claimed to be the first special work on the general pathology

of scrofula which has appeared in English for many years, but the extreme prevalence of scrofula, the very misty views entertained upon the subject by many physicians, the great changes which have taken place in our knowledge of its pathology, and lastly, the admirable manner in which Mr. Treves has treated the matter, all tend to enhance the importance and value of the book.

Since the days of Phillips and Glover scrofula, after long neglect, has been subjected to special study by many observers upon the continent of Europe, and the results of that study, as well as that bestowed upon it by himself, are given to the profession by Mr. Treves in this modest-sized volume. These results are said by Mr. Treves to amount to an almost complete reconstruction of its pathology, a more distinct definition of its clinical outline, and the giving of a more distinct individuality to the disease. A book which claims to present to the profession such important results, and doctrines, is entitled therefore to the somewhat extended notice we propose to give it.

Mr. Treves attributes the illy-defined limits so often assigned to scrofula, and the opposed views entertained concerning it, to two causes. 1. The difficulty of isolating scrofulous disease from the manifestations of mere ill-health. 2. The persistent attempts to find some characteristic anatomical element for every disease. Thus one man will speak of a patient as slightly scrofulous, while another will regard struma as no less a specific affection than is cancer—the discrepancy being dependent upon the fact that the one man is a clinician, the other a pathologist. Continued observation has gradually limited the area of the condition once described as mere frailty of constitution, and has demonstrated that certain disorders are no longer to be thus classed, but are in reality specific, and dependent upon certain ascertained pathological conditions. The clinical observer who once was in the habit of regarding every manifestation of poor health as scrofulous, is now obliged to recognize some of these manifestations as the result of hereditary syphilis, and others as having their origin in rachitis. This disposition to regard scrofula as the *omnium gatherum* into which could be cast any affection without precise and definite pathological limits, has tended to discourage close histological research into its nature, and it has only been of late that such examinations have been made with sufficient accuracy, to permit of the attempt to reconstruct our theories upon the subject.

Mr. Treves's second chapter is taken up with the pathology of tubercle, and the relation which exists between it and scrofula. After discussing the very marked modifications in our knowledge of the histology of tubercle undergone of late years, and showing that the latest microscopical investigations do not permit us to assert that it presents any specific anatomical element, Mr. Treves goes on to consider what is the relation existing between tubercle and scrofula. It is shown that in a scrofulous gland the most perfect and typical primary tubercle may be met with. In cold abscesses, in lupus, and in some other scrofulous manifestations, true tubercle is found, and is known by appearing as a mass, consisting of one or more giant cells, surrounded by a zone of epithelioid cells and the whole inclosed in leucocytes or embryonic cells. But these distinctly tuberculous appearances are not found in all scrofulous diseases, and in some of them have never been demonstrated to exist at all. Mr. Treves accounts for this fact upon the supposition, or theory, that tubercle is the highest manifestation of a certain process, to which less perfectly developed disease may

never attain, and thinks it unwise to draw a fast line of distinction between tuberculous and scrofulous disease of a gland, which may altogether be a question of degree and not of difference in nature. He however thinks that it is an error to speak of a scrofulous disorder as tuberculous, even although the existence of primary tubercle may be demonstrated in the case, for the reason that certain grave consequences have become associated clinically with the title miliary tubercle, which are by no means true of scrofula. Indeed, the relationship existing between scrofula and tuberculous disease is close, and yet distinct. Primary tubercles will be found in both diseases, but the aggregation of these primary tubercles, the gray granulation of Laennec, is very rarely, if ever, found in a truly scrofulous disorder. The miliary tubercle represents the more advanced step in a process, which in scrofula is very rarely reached, caseous degeneration setting in, and cutting short the process. Thus it would be correct to regard scrofula as a milder form, or stage of, tuberculosis.

As regards the nature of tubercle Mr. Treves is not inclined to adopt the generally received view that it is a neoplasm, although it is not yet definitely settled whether of connective, or adenoid origin. However this may be, our author is convinced that it has its beginning in a peculiar form of inflammation, that it often is accompanied with inflammatory signs, and that in those cases which are scrofulous, and yet in which tubercle exists, it may proceed to suppuration and cure, as is often seen in the case of a gland. He further explains his view by a comparison of tubercle with syphilis, and thinks that as that disease is attended with the formation of gummatous growths dependent upon a peculiarity in the inflammatory process, so tubercle follows a peculiar inflammation and is properly an inflammatory neoplasm.

Chapter IV. discusses the subject of the inoculability of tubercle. In it many recent experiments are detailed and criticized, and the conclusion arrived at that nothing is as yet definitely settled. Hitherto our attention has been fixed upon tubercle, the anatomical ally of scrofula, now, in Chapter V. we come to scrofula proper, and a carefully studied definition of it. The whole chapter is devoted to an examination and exposition of the definition given, which may be summarily described as a tendency to inflammations of a peculiar type, usually chronic, induced by slight irritation, and prone to continue after the removal of the irritation. There is also a marked tendency in the disease to spread locally, and to involve lymphatic tissue. In this vulnerability of lymphatic tissue we have the most distinctly characteristic trait of scrofula, and recent experimenters and microscopists seem very generally to unite in attributing to it most of the well known scrofulous manifestations. The whole chapter is an interesting study, but we are obliged to content ourselves with this brief summary of its contents.

In the next chapter Mr. Treves considers the relation existing between scrofula and phthisis, and the antagonism existing between scrofulous diseases. Here, also, he goes largely into the conflicting views and theories entertained by competent observers, through which we shall not attempt to follow him, confining ourselves to a statement of his own opinions, which are very clearly given. Mr. Treves believes that scrofula and phthisis are due to the same morbid process, that the morbid action is identical, and the same, in the two diseases, and that phthisis may be regarded as scrofula of the lung, and a scrofulous lymphatic mass as phthisis of a

gland. He thinks this opinion is proven to be correct by the facts that the two diseases occur in persons of the same habit, that the same causes, as measles, predispose to both, as pointed out by Ruehle and Thaon, and that they seem to be mutually associated hereditarily.

Mr. Treves further points out that the definition given of scrofula applies almost equally well to phthisis, that the histological resemblance between the two affections is also very close, as is shown by the researches of Niemeyer, Ruehle, Rindfleisch, Grancher, and Klein, and finally that the two diseases occur sometimes in the same individuals.

While thus maintaining the identity of scrofula and phthisis, Mr. Treves thinks that the comparative rarity of instances in which both diseases appear in the same person, is accounted for by the fact that there is a decided antagonism between scrofulous diseases of all kinds, and that the occurrence of one scrofulous manifestation prohibits the appearance of another. That this is a fact most surgeons will admit, and the author of this book cites some extended observations made by him at the Margate Infirmary in its confirmation.

Chapter VIII. is concerned with the etiology of scrofula. Premising that it may be either hereditary, or acquired, the first place among the determining causes of scrofula is given to phthisis in the parents. Mr. Treves does not think that we can safely accept the statement frequently made that phthisis in the father exerts a more deleterious influence upon the offspring than does the same disease in the mother, but, on the other hand, his observations lead him to think that scrofula in the mother is more influential as a cause than where it exists in the father. Having given scrofula in the parents the second place among the hereditary causes of scrofula, Mr. Treves goes on to consider the influence of poor health, and, more especially, of syphilis, in the parents, and thinks that while we may often be in doubt concerning the influence of the former, we must admit the power of the last. Considerable space is also given in this chapter to the other predisposing and exciting causes of scrofula, and the pleasing conclusion is reached that the disease has undergone a diminution in frequency of late years by improvements in sanitary science, the improved condition of the poor, "and by advances, possibly, in the science of medicine, and in the treatment of disease."

It will be noticed that Mr. Treves bestows very faint praise upon his own science in the words we have just quoted, and it certainly seems to us that he errs in so doing. The improved sanitary condition, of which he appears to entertain no question, is very largely a triumph of medical science, and it is but one of the triumphs which mark the progress of medicine. It is a mistake to think that that progress has been small because we are confronted by many diseases we cannot cure. In the last fifty years the accumulations of exact knowledge have been many, and the application of principles deduced from observations, to the cure and prevention of disease, have been neither few nor insignificant. We, therefore, think that Mr. Treves might well venture to claim a little more for our science.

In Chapter IX. "the scrofulous individual" is surveyed *in extenso*, and the whole range of peculiarities and characteristics which go to make up that oft described personage, are given in detail. The most recent contributions to this subject have been the typical portraits exhibited by Dr. Mahomed and Mr. Galton at the International Congress of 1881, and which have since appeared in the Reports of Guy's Hospital for the same

year. In his survey of "the scrofulous individual" Mr. Treves passes in rapid review the whole series of scrofulous manifestations—manifestations which are by no means to be found in any one person, but are recognized as scrofulous whenever they appear in any individual—and he thus presents a general descriptive account of the appearances of the disease itself as commonly seen.

The second part of Mr. Treves's book deals with scrofulous glands. It is the most important, and of most interest to surgeons. A preliminary account is given in Chapter X. of the anatomy of the external glands, which is of much importance, as bearing upon the regions from which they individually receive lymph vessels, and thus enabling the surgeon to look intelligently for the seat of the irritation, which has been the exciting cause of the mischief. Especially is this shown to be important in view of the statements contained in the next chapter, that in almost every case some exciting cause can be discovered to have induced the gland disease. Mr. Treves, while not denying that cases occur in which this exciting cause cannot be ascertained, inclines to the opinion that such a condition only exists from defective or deficient knowledge. He takes issue with Dr. Allbutt that a scrofulous gland can arise from a local cause without an already existing predisposition, and maintains that the tendency is an essential element in the case. After citing some instances which go to fortify his opinion in this matter, Mr. Treves proceeds to the consideration of the local lesions which induce gland disease. These are numerous and do not need recapitulation here. But there is one important statement made while speaking of the very great preponderance in the number of cases of cervical adenitis, which it is well to emphasize. Mr. Treves accounts for this preponderance upon the ground that "the peripheral lesions most active in exciting gland disease in scrofula are those that are located in the adenoid tissue of a mucous membrane," and that this adenoid tissue, while existing in most of the mucous membranes, is found in much the greatest amount collected about the mouth and pharynx, forming in the latter the largest masses of such tissue in the body, viz., the tonsils. Adenoid or lymphoid tissue is also plentiful in the bronchial and intestinal mucous membranes, and we accordingly find that the cervical, the bronchial, and the mesenteric glands are those most frequently affected, in close correspondence with the amount of adenoid tissue existing in their immediate neighbourhood.

In Chapter XII. are detailed the pathological changes observed in lymphatic glands. The first change noticed in a gland taking on diseased action is an increase in the number of the lymph-corpuscles, both in the sinuses and in the gland tissue proper. The origin of these corpuscles is as yet under debate, their presence having been variously accounted for, it having been variously suggested that they are derived from some initial inflammatory lesion, that they are leucocytes from the neighbouring blood-vessels, or that they originate by proliferation of the existing cells.

Contrary to the frequently made statement that this accumulation of cells first occurs at the periphery of the gland, Mr. Treves says that it invariably begins at the centre, in the deeper or medullary portions of the gland.

The next change noticed is the appearance of spots, which, upon closer scrutiny, are found to be occupied with very varied cellular forms, from lymph corpuscles to the large cells with glistening protoplasm first observed by Rindfleisch, and regarded by him as characteristic.

When the progress of the disease is acute, after various other alterations, spots of opaque tissue appear, and go on to complete caseous degeneration. When, however, the disease is less acute, there is a much more prominent development of fibrillar elements, and the proper adenoid tissue, the reticulum within the sinuses, is more extensive and dense, and giant cells appear in the opaque patches which form. These giant cells are well known to observers, and in the opinion of Mr. Treves are lymph-coagula involving in their coagulation various cell-elements. As the reasons for this opinion the author claims that the position of these cells is probably in the lymphatic sinuses of the gland, although this is not always apparent, owing to the rapidity with which the anatomical details of the part are lost. They precisely resemble the giant-cells sometimes found in chronically inflamed connective tissue which occupy the lumen of lymphatic vessels; then at the time of their advent a material precisely similar to coagulated lymph appears throughout the gland.

We have not space to follow our author any further in the pathological details of gland disease; they have been made public in his lectures at the College of Surgeons, in March, 1881, and are given minutely in this volume. His descriptions are also made much plainer by the plates at the end of the volume, prepared by him for an article to appear in the forthcoming new edition of Holmes's System of Surgery.

Chapter XIII. deals with the symptoms and diagnosis of scrofulous lymphatic glands. Mr. Treves draws attention to the fact that glandular enlargements are not generally symmetrical, but an exception to this rule is sometimes observed where the enlargement depends upon hypertrophied tonsils. In these cases symmetrically placed glands can often be felt at the level of the hyoid bone. The progress of the disease in glands is very uncertain, and, where several are involved, the rate of progress may be very different in them. Resolution may occur at various stages and in very different kinds of glands, but it is most rare in those cases where a whole chain of lymphatics is involved, and where well-developed tubercle is revealed by the microscope. Suppuration is a very general result, but it is difficult to decide the proportion of cases in which it occurs, on account of the very slow progress of the disease, extending, as it often does, through many years. In 131 cases, obtained from the records of the Margate Infirmary, suppuration occurred in 93 instances. When suppuration does occur it may be either in the gland itself, or in the connective tissue around it. It is important to distinguish between these two kinds of abscess. When situated in the gland tissue it yields a caseous pus, whereas, when located in the surrounding tissues, it will be healthy and laudable; but, in either case, the abscess will continue to discharge until the whole of the diseased gland is gotten rid of. Often, when the gland has been removed, either with or without surgical interference, another gland may appear and take on similar action, and the whole tedious process be gone through with again. Injurious pressure is sometimes exerted by enlarged gland masses. This is most common in the mediastinal glands, but is sometimes, though rarely, seen in connection with cervical masses. Leucocythæmia is a very rare complication. Mr. Treves says but little upon the subject of diagnosis, and thinks there is little danger of confounding a scrofulous gland with anything but the tumours connected with Hodgkin's disease, from which it is readily distinguished, however, by the more rapid progress made by the latter. Yet the matter is not always so simple. The writer of this review recently removed a gland from beneath the angle of

the jaw, which was solitary, round, the size of a bantam's egg, and with such a sense of tense fluctuation, that he was quite uncertain whether it would turn out to be a gland or a cyst.

Chapter XIV., and last, is occupied with the treatment of scrofulous lymphatic glands, and contains very little that is new. Indeed, the therapeutics of scrofula are altogether out of proportion to its pathology. The latter may be unsettled, but about the former there is not much difference of opinion. Improved hygienic surroundings, sea air, iron, and, above all, cod-liver oil, are the general remedies upon which the most reliance is deservedly placed. Iodine, once so highly lauded, has not preserved the reputation it once enjoyed. Yet that the syrup of the iodide of iron is a valuable preparation is admitted by Mr. Treves, and it would shock many among us were its virtues called in question, but how much the iodine in it has to do with its efficiency may well be doubted.

In speaking of improving the hygienic surroundings of the poor, Mr. Treves makes the suggestion, whether the institutions whose wards are crowded with confirmed cases of scrofula, would not accomplish more good if the lighter cases, those in which the taint is less deep, were received instead. He seems to think that it would be wise to aim more at utilizing their advantages for prevention, than at ameliorating and improving the condition of hopeless cases.

Mr. Treves's advice, concerning local treatment, is excellent. He lays much stress upon the importance of removing any ascertained cause of irritation. Particularly should the condition of the mouth and pharynx be examined into in cases of cervical adenitis, and he advises that where enlarged tonsils exist they should be at once removed. An enlarged gland should be regarded as evidence of some mischief existing elsewhere, and a careful search should always be made for it. The indiscriminate and long-continued use of poultices is condemned. Early exit should be given to pus. It is a great mistake to allow large accumulations to take place. Mr. Treves condemns the external application of iodine in the early stages of gland disease, when the process is comparatively active, but thinks it is often of value when the disease is far advanced, and extremely indolent. When he uses it he relies upon the *unguentum plumbi iodidi* rubbed into the part, morning and evening.

With regard to operative interference, Mr. Treves thinks that when the tumour can be easily and safely removed it is well to do so, thus getting through rapidly with that which nature, unaided, is very long in accomplishing. He thinks it is advisable to operate when the tumour is solitary, superficial, and without adhesions; when, though these are many, they have increased without pain, are limited and few; and finally, when a single fairly movable gland is exerting injurious pressure upon neighbouring parts. Mr. Treves has seen no ill effects follow from operations thus selected, and thinks we can dismiss all fears of exciting a fresh outbreak of the disease thereby.

If the tumours will shell out easily the operation is simple and very satisfactory, but should the operator find the adhesions firmer, or the number of glands much greater, than he anticipated, it is much safer to do too little than too much.

Scooping out the gland by means of a Volkmann's spoon, inserted either through a sinus or a small incision, Mr. Treves regards favourably when the gland is fixed, and there is, therefore, no risk of a part of its contents

escaping into the cellular tissue. When in these cases a deep cavity is left, a drainage tube should be inserted.

The puncture of a scrofulous gland by a cautery, the size of a No. 7 catheter, Mr. Treves thinks, is one of the best measures at our disposal. He has practised it repeatedly and very satisfactorily. The cautery is thrust through the skin and into the body of the gland in several directions without removal, thus making but one opening in the skin.

If pus or cheesy matter follows the removal of the iron, a poultice is applied, but if none such makes its appearance, a simple dressing is sufficient. Our author thinks it is simpler than scooping, and much preferable. How it acts he does not know, but Mr. Treves is satisfied that it favours speedy resolution, which, in cases where no cheesy matter escapes, is accomplished in from fourteen to twenty-one days.

Of interstitial injections, Mr. Treves has a rather poor opinion, nor is he more in favour of treating diseased glands by setons, electricity, crushing between the fingers, subcutaneous laceration by a cataract needle, or long-continued compression.

For the evacuation of gland abscesses he strongly recommends the use of the actual cautery, rather than by the limited incisions usually employed. He opens the abscess by a fine cautery, and allows it to empty itself. Should discharge continue for an undue period, he makes a larger opening into it, and if a gland mass is found projecting into the cavity he punctures that also with the hot iron. Where persistent sinuses result, Mr. Treves treats them upon general principles, and reminds his readers that one of these is rest. He, therefore, advises that where the neck is the seat of the disease, an attempt should be made to restrain its movements by a gutta-percha stock, extending from the occiput and lower jaw to the chest and shoulders.

We have now followed Mr. Treves to the conclusion of his work, and, in taking leave of it, must repeat the favourable opinion we expressed of its value when we began. While there is room for some condensation and a better arrangement of the pathological portion of the work, it cannot be doubted by any one who carefully studies this book that medical literature has been a gainer by its publication. It is not a book to be read hastily, but will repay a close perusal. The plates appended are good, and help to make clear Mr. Treves's descriptions of the pathology of scrofulous glands.

S. A.

ART. XX.—*A System of Surgery, Theoretical and Practical, in Treatises by Various Authors.* Edited by T. HOLMES, M.A. Cantab. First American from Second English Edition, thoroughly revised and much enlarged, by JOHN H. PACKARD, A.M., M.D., assisted by a large corps of the most eminent American Surgeons. In three volumes. Vol. III. Philadelphia: Henry C. Lea's Son & Co., 1882.

WHEN Dr. Packard, hardly more than eighteen months ago, called upon his American colleagues to aid him in the revision of this important work, few would have believed that so prompt and expeditious a response could possibly have been made. But little more than that amount of time has

been occupied between the distribution of the work, and the completion of the three capacious double-column volumes. Such enterprise as this is in amusing contrast to the stolid German method, which plans and sets agoing a most comprehensive handbook or system without any well defined notions on the part of the originator as to the prospect of its being completed during an ordinary lifetime. Brilliant as are the achievements of Germany and other European nations in the domain of science, it is evident that the practical character of the Americans enables them to put the work that has been accomplished before the world in its most available and desirable form. Surely few tasks could be more difficult than the attempt of Dr. Packard to renovate by transfusing the life blood of the last decade of medical science into a body from which the freshness of youth has departed. We must confess that it has been accomplished more satisfactorily than we believed possible, in spite of the undeniable fact that the wrinkles are here and there unpleasantly conspicuous.

The present volume is divided into six parts. Regional surgery is concluded in the first part, disease of the joints, bones, and orthopedic surgery come next: there is a short section devoted to the nervous system, another to gunshot wounds, another to operative surgery, and part six brings up the rear with a miscellaneous collection of subjects, among which we notice an entirely new article on the skin by Dr. Van Harlingen, of Philadelphia, and one on hospitals, and the valuable appendix by Dr. Norton Folsom.

The book opens with an article on Diphtheria and Croup, in which the old views on the non-identity of the two diseases are left untouched by the American reviser. The former is likened in its febrile character and epidemic influences to scarlet fever, while the latter is regarded as an inflammation of the air passages attended by the exudation of a false membrane. It should be remembered that it is a matter of no small practical importance to establish a well-formed professional opinion on this question, as it is the custom of many elder practitioners to look upon croup as a non-contagious disease. Whether or no the type of "old-fashioned croup" ever existed as described in the text-books, certain it is that few practitioners of middle age are able to identify it with what has been observed in their own experience. The article on Diseases of the Larynx is, we should say, rather medical than surgical, and the arrangement of the book which separates injuries from diseases obliges the reader to refer to the first volume for what is to be said on tracheotomy.

The chapter on the Thyroid Gland seems to us altogether unworthy of such a book as this. The able contributions of Virchow and others to the anatomy and etiology of goitre, and the success of Billroth, and indeed of surgeons in all countries where the disease is at all frequent, in operations for extirpation of the tumour, have placed the surgical aspect of this gland on a footing which requires a thorough revision of the original article. The brief notes which the reviser, Dr. Cohen, has made refer chiefly to experience in treatment in his own practice, which have been confined chiefly to local applications. On the other hand, the succeeding article on apnœa is excellent, we might almost say classical. Considerable prominence is given to the Marshall Hall and Sylvester methods which have always seemed to us awkward and complicated ways of doing what may be easily and simply effected by manual compression of the thorax. In the hands of excited and inexperienced persons they would be worse than useless, tending as they do to invest a very simple act with the complica-

tions of a difficult operation. We notice one very important omission in the rules of treatment in cases of impending death by apnœa given by the Royal Humane Society, and that is that success has often rewarded the efforts of hours. This fact cannot be too strongly impressed upon the public, for we have little doubt that even at the present time, after all the attempts which have been made to educate the public, cases are constantly abandoned as hopeless which might be restored by persevering efforts at resuscitation.

Diseases of the bones, joints, and spine, and orthopædic surgery form the greater portion of Part II. Dr. Markoe has had a difficult task in the revision of Holmes's article on diseases of the bones, which, like most English work on pathology, partakes of the character of a bygone period in medical literature. This is strikingly shown in the part devoted to malignant tumours of bone, where the reviser has made extensive and judicious additions, borrowing largely from Dr. S. W. Gross's excellent summary of modern news on that subject. Mr. Holmes appears to much better advantage in the chapter on excisions of bones and joints, which follows a department in which English surgeons have justly achieved distinction. The author correctly says of Lister's operation of excision of the wrist that it is one of the most tedious and difficult in surgery; our own experience favors the much more simple method of lateral incisions so made as to avoid the vessels, and to do the minimum amount of injury to tendons. These should be modified so as to adapt themselves to existing wounds of sinuses. The real obstacle to future usefulness of the hand after this operation is the shortening of the metacarpal bones, thus making subsequent motion at the metacarpo-phalangeal articulations difficult. We are inclined to agree with Mr. Holmes's view that "many cases will terminate quite as well if judiciously treated by incisions when necessary, the removal of portions of bone as they become loose, and above all the constant and persevering use of passive motion to the fingers." Excision of the hip is not regarded with favour, but Dr. Bradford in the succeeding article on disease of the joints shows that much better results have been attained during the last ten years than formerly. Excision of the ankle-joint is an operation which has never attained much popularity. So distinguished a surgeon as Langenbeck has, however, been one of its enthusiastic advocates, but his experience has been chiefly confined we presume to traumatic cases, in which it is pretty generally conceded that satisfactory results may be obtained. The author has failed to note the success of this operation in disease during the period of childhood. On the other hand, it should not be forgotten that Sayre has obtained most excellent results with conservative treatment, which, however, is perhaps better adapted to disease of the tarsus than the ankle-joint proper.

The revision of the articles on Diseases of the Joints, Spine, and Orthopædic Surgery has been undertaken by Dr. E. H. Bradford, whose additions, although necessarily brief, are all judiciously made. The statement of present views on the treatment of diseases of the hip and spine are favourable examples of his work, which has greatly increased the value of these chapters. In the article on Orthopædic Surgery, or, as the reviser would have it, "Orthopedic," we notice some remarks on the treatment of inveterate cases of club-foot by excision of a wedge-shaped portion of the tarsus. The bony prominence or hump, which is usually marked in these cases, and is the chief obstacle to the maintenance of a good position, is thus removed, and the foot comes readily into place with

most satisfactory results, as any one who has had an experience with this operation will, we feel sure, testify. Dr. Bradford has also added some remarks on osteo-clasis for curvature of the bone, in which he and some of his colleagues have achieved much success.

Part IV. is devoted to Gunshot Wounds. The original article, by Thomas Longmore, the Professor of Military Surgery at Netley, is one of the classical contributions to this subject, and is doubtless familiar to the readers of this Journal. The reviser of the present edition is Dr. Hunter McGuire, who had a large experience in the Confederate army during our late war. We regret to find, however, that he has not been able to avail himself of the experiences of the Southern armies, of which the world has as yet heard little or nothing, but has relied almost exclusively upon the Surgical History of the War for his additions to the text.

Part V. deals with Operative Surgery, including, as it should, anæsthesia. This article is of unusual interest, giving, as it does, the contrasts of opinion which a decade has brought about. In the original English article chloroform is of course given the first place—the writer prefacing his remarks upon this agent by the statement that “sulphuric ether is still extensively used as an anæsthetic in the United States; but in Europe chloroform is generally preferred to it.” Dr. Reeves, the reviser, shows the change of opinion, not only in Europe but in this country, in a striking manner. Ether, he says, is now used exclusively in at least one-third of the hospitals in Great Britain, while there is shown a general disposition of the profession in that country to abandon chloroform for ether. In this country he finds that “some strongly-marked geographical lines can be drawn.” All New England surgeons use ether. In the cities of New York, Brooklyn, and Philadelphia, there are thirty-six surgeons who use ether, three who use either agent, and only two who use chloroform exclusively. The remainder of the country may be divided into two sections, North and South, by a line running west between Maryland and Pennsylvania, and along the Ohio. North of this line the figures are roughly thirty-seven to twelve in favour of ether, while on the southern side they are in favour of chloroform twenty to twelve. A note by the editor, Dr. Packard, on the “Primary Anæsthesia,” first described, we believe, by himself, concludes the article.

The descriptions of operations are sufficiently explicit, as a rule, and the illustrations are of a sufficiently high order of excellence. Dr. Packard has appended a note on trephining, colotomy, and excision of the rectum. These are doubtless intended to fill out the list, but as these operations are described more at length elsewhere, we think their brief notice at this point is misleading, in spite of the requisite references. The directions for colotomy are, moreover, inexact, and, as to some points, incorrect.

The concluding department of the volume and work is composed of a miscellaneous collection of subjects, some of which are in their appropriate places, while others were evidently the stragglers in the original act of publication.

We are disposed to sympathize strongly with the reviser of Birkett's article on Diseases of the Breast. As might be supposed, the value of such an article depends chiefly upon the thoroughness with which that part relating to the surgical pathology of the breast has been made to correspond with modern views. Dr. McGraw has succeeded in giving a very excellent summary on these points in the brief space which has been

allotted to him. We could have wished that this article, like the one which follows on Diseases of the Skin, had been entirely rewritten.

Dr. Van Harlingen has attempted to cover the entire ground in this specialty, rather than to confine himself to such portions as belonged strictly within the domain of surgery. Due attention has been given to the practitioner's wants, the text being well filled with directions for treatment and prescriptions. The article on Eczema occupies considerable space, as it should, and seems to us a most valuable one for reference. There are some interesting cases of neuroma cutis, with illustrations of the microscopic structure reproduced from Duhring's book, but we do not find mention of the investigations of Recklinghausen on this subject which have recently appeared. We notice the use of the term anthrax in connection with carbuncle, instead of malignant pustule, where it rightly belongs. The author, we are glad to see, is in favour of the use of the dermal curette, but does not urge it sufficiently strongly in epithelioma. Its advantages in the superficial forms of this disease, over the knife, are great, in that it saves the greatest possible amount of healthy tissue; but it is usually necessary to follow up its use with caustics, or the cautery. Caustics alone should only be used when it is quite certain that the entire disease will be reached by the agent, otherwise the portion left is likely to be stimulated into an unnatural activity. Dr. Van Harlingen has had the good taste to quote from American authors, when possible, and it is gratifying to see how much work has been accomplished by them since dermatology became a recognized specialty in this country.

The articles on parasites and venomous insects have been entrusted to Dr. Leidy, whose additions are confined to the former. We notice some interesting remarks on the introduction of the guinea worm through drinking water; also a description of the *filaria sanguinis*, and the long list of diseases ascribed to it. It seems that the mosquito is supposed merely to transfer the worm to water, from which those drinking it become affected.

The article on the Surgical Diseases of Childhood, which originally appeared in the appendix, was written by Messrs. Holmes, Broadhurst, and Shaw, and is now revised by Dr. Samuel Ashhurst. It was probably added by the editor to fill out certain deficiencies which became apparent as the successive volumes appeared. We do not think such a subdivision of any special practical value, and we can readily see, and, indeed, have personally experienced the disadvantage to the reader, who is unaware of this unusual arrangement. The account of malformation of the rectum and anus, for instance, which is particularly well given, might easily be overlooked by one who naturally seeks for such information under diseases of the rectum. The illustrations of this subject are, by the way, of unusual interest, figure 953 showing the so-called paradox of M. Huguier, or the position of the sigmoid flexure in the right groin of an infant, on whom colotomy had been performed in the left groin. The reviser has found extremely few additions to make. The next article on Surgical Diagnosis and Regional Surgery is also, in our opinion, one of those articles which few read and no one refers to. There are a certain number of topics which it should be the duty of the editor to look out for, and to work in the text in their appropriate places. The few instruments described, as the clinical thermometer, the sphygmograph, could easily be inserted elsewhere, and as the whole System is arranged on a basis of regions, we fail to see the *raison d'être* of a special article on that subject.

The closing chapter on Hospitals has been enriched by a very valuable

paper by Dr. Norton Folsom, who was one of the gentlemen selected by the Trustees of the Johns Hopkins Hospital, to prepare the volume on Hospital Construction and Management. The reputation made by our countrymen during our late war has been well sustained by the progress made in the construction of our civil hospitals since. The remarks on the site and drainage of hospitals show how high an estimate is placed upon a proper attention to those parts of the building which do not appear above the surface, and impress also upon the reader how much we still have to learn about these vital problems. Dr. Folsom's remarks on the form of hospitals are specially interesting, as embodying the views of those who have made a study of recent improvements. He says of the present popular method: "Those who consider some sort of pavilion plan the only justifiable method of construction, are by no means agreed as to whether they should consist of one or two stories." The merits of each plan are briefly and clearly stated. A good word for the now popular training-school for nurses, and on the importance of placing a medical man in the position of superintendent, who, as he quotes Dr. Billings, should be the health officer of the hospital, closes the volume. J. C. W.

ART. XXI.—*Annual Report of the National Board of Health, 1879.*
8vo. pp. 477. Washington: Government Printing Office, 1879.

THE first annual report of the National Board of Health, recently issued from the Government printing office at Washington, is a bulky volume of 477 closely printed pages, containing a vast fund of useful information upon some of the most important sanitary topics of the day.

The publication of this report marks an era in the history of sanitary legislation in the United States. It chronicles the birth of an organization of which there has long been a pressing need, as indicated by the hearty response and strong coöperation with which it has met from all parts of the country and by the eager confidence imposed in it by the people, and which bids fair to become a mighty power in the land for good, not only by the judicious exercise of its functions of investigating the preventable causes of disease, accumulating precise information, and disseminating the best knowledge and advice upon all subjects relating to public health and hygiene, but also by the performance of important services in connection with the administration of sanitary law. It has already established its claim to usefulness by its active and practical efforts in systematizing and regulating inland and maritime quarantine practice, according to the most advanced knowledge on the subject; by giving warning and advice and furnishing aid in times of public peril; by encouraging and coöperating with State and local movements in the interest of public health; by the methodical pursuit of scientific investigation of sanitary questions, of individual, local, and national importance; by its strenuous efforts for the attainment of uniformity in sanitary legislation, organization, and practice, especially in the methods of collecting and reporting vital statistics; and by the establishment of a weekly bulletin as a medium of diffusing information.

In scanning the report one is impressed with feelings of surprise and

gratification at the amount, diversity, and importance of the labour performed by the board during the brief period of its first year's existence. These results could hardly have been expected had not its members been well qualified for the duty by previous special training.

The volume consists of the report proper, which is a brief and concise statement of the operations of the board during the year 1879 under the provisions of the Acts of Congress of March 3d and June 2d of the same year, and of a series of voluminous reports and papers, mainly by experts, upon subjects wisely selected from among those claiming the earliest consideration and investigation. The reports and papers, which are elucidated by numerous maps, charts, and diagrams, are grouped together under proper headings and arranged in the form of appendices. These constitute the main bulk of the volume.

Appendix A refers to the organization of the board under the Act of Congress, approved March 3, 1879.

Appendix B contains the preliminary report of the Havana Yellow Fever Commission, consisting of Dr. S. E. Chaillé and Col. T. S. Hardie, C. E., of New Orleans, Dr. John Guiteras, of Philadelphia, and Surgeon George M. Sternberg, U. S. A. It consists of forty pages of closely printed matter and statistical tables, and is replete with information, which, though not really novel, will be of great value in arriving at a better understanding of the history, causation, endemicity, and mode of propagation of yellow fever in the island of Cuba, and the means of preventing the introduction of the cause of the disease into the shipping at Cuban ports.

The report embraces a study of the principal ports of Cuba and of their commercial relations to the United States; the endemicity of yellow fever in Cuba, and the causation of this endemicity; the means of improving the unsanitary conditions of Cuban ports, and the measures which can and should be adopted to prevent the cause of yellow fever from affecting the shipping at Havana, Matanzas, and other Cuban ports, and its transportation to the United States. The results of a series of investigations are presented, which were undertaken with the view of shedding light upon the obscure subject of the causation of this disease. They are detailed under the heads of examination of the blood in yellow fever, experiments upon animals, culture experiments, examination of the water of the harbour, and examination of the air. A brief synopsis of morbid anatomy and pathological histology, and a report by Dr. Chas. Finley, of Havana, on the increased alkalinity of the atmosphere during the prevalence of yellow fever, complete the subjects of the report.

It may be considered as established, that yellow fever is endemic in the Island of Cuba, the history and evidence showing that it has been persistently prevalent in Havana every year since 1761. Strong evidence has also been brought forward to disprove the theory of the spontaneous origin of the yellow-fever poison on board ships, and also to prove beyond question that this poison is on the shore and not in the water of the harbour. The chief thing to be done is to eradicate the disease from Cuban ports, but in this matter the United States has no jurisdiction. The main dependence must, therefore, be placed in palliative measures, such as the application of means to prevent the introduction of the cause of yellow fever into the shipping, and of eradicating the poison after it has been communicated to vessels, and of preventing such vessels from being sources of infection to other shipping and places. In pursuance of this object Congress passed the law of June 2, 1879, elsewhere noticed, which, if it had been per-

mitted to be enforced, would have been a most important, progressive step toward the solution of this latter problem. This measure was rendered inoperative through the non-concurrence of the Spanish Government, and now an effort is being made to secure an agreement, among all maritime nations interested in the enforcement of the act, upon an international sanitary code; or, if this be not at once practicable, then, at least, upon the establishment of an international system of notification as to the sanitary condition of ports and vessels.

Appendix C contains a preliminary report by Prof. Ira Remsen, of Baltimore, of an investigation concerning the best method for determining the amount of organic matter in the air, which is of some special interest.

Next follow two valuable reports, contained in Appendices D and E; the one by Prof. C. Lewis Diehl, on the Deteriorations, Adulterations, and Substitutions of Drugs, to which a bibliography is appended; and the other by Dr. R. C. Kedzie, on the Adulteration and Deterioration of Food. Prof. Diehl's report covers sixty pages, and includes tables showing the principal inferiorities of drugs, such as adulterations, substitutions, etc., recorded in the current literature of the United States during the past twenty-five or thirty years; the causes of such inferiorities; and also a fragmentary list of drugs rejected at the different custom-houses since 1848. There is also contained in the report a draft of a proposed law to regulate the practice of pharmacy and the sale of poisons, and to prevent the adulteration of drugs and medicines.

On the authority of Dr. M. I. Bailey, special examiner of drugs, nearly one-half of the drugs imported into New York before the year 1848 were of a worthless description. In that year Congress passed a law regulating the importation of drugs, and designed to exclude inferior and sophisticated drugs and medicines, which operated remarkably well during the first five or six years of its application. Subsequently, however, its execution, from one cause or another, became more or less inefficient and inadequate at various periods of its existence, and, had not the powerful influence of the American Pharmaceutical Association been persistently exerted in directing attention to abuses connected with the execution of this law, and in shaping the condition of the drug market, the law in all probability would, practically, have become a dead letter. As it is, there is the greatest room for improvement, and a careful revision and extension of the law are greatly needed, as Prof. Diehl has amply demonstrated.

While the Government can, to a very great extent, ameliorate the abuses in the drug trade by preventing, or reducing to a minimum, the introduction of inferior drugs and medicines from abroad, and by exercising a general supervision over commerce in such articles, it is powerless to reach the inferiorities that are produced at home. Says Prof. Diehl: "Congress has no power to pass a general law bearing upon this subject that shall have equal application in all the States." In this country, measures which shall restrict and prevent the sale of impure and adulterated drugs at home "must necessarily be enacted by the legislatures of the States to which they are to apply, and will be effective throughout the United States only if uniform action can be had in this direction in every State."

Many States have laws upon the subject which are very imperfect, and more or less obscure, and lack suitable provision for their enforcement; therefore, they are, in great measure, inoperative.

What is needed is uniformity of action throughout the United States,

and if, as suggested, the General Government were to enact a law for the District of Columbia, similar to the rough draft of a proposed law prepared by Dr. Squibb and presented with this report, to serve as a type for similar enactments in the different States, the proposed end might be accomplished. Independent of legislative enactments, the greatest good is being accomplished by the use of moral and educational means, such as have been employed by the American Pharmaceutical Association and kindred organizations. Both of these forces are required to effectually modify or prevent adulterations in drugs and food.

Dr. Kedzie's report relates solely to the discussion of the subject of the deterioration and adulteration of the principal substances used for human food in the United States. If we mistake not, the investigation of the general subject of these reports has been continued by the National Board of Health, and the results obtained have formed the basis for the elaboration of a proposed law which has been freely indorsed throughout the United States by men specially qualified to judge of the subject, and is now awaiting the action of the National Assembly, having been favourably reported, with some amendments, by a Congressional committee.

The next appendix, marked F, contains a report by Prof. James Law, of Cornell University, on the Diseases of Domestic Animals; and one by Dr. T. S. Verdi, of Washington, on Cattle Disease in Relation to the Health of Man and in Political Economy. Prof. Law considers briefly in his report: 1st, such animal diseases as determine specific and communicable disorders in man; and 2d, the affections of the domestic animals which are not communicable to man, but are transmissible from animal to animal, so as to constitute veritable plagues which tend to undermine our agricultural prosperity. He shows how highly important it is that the functions of the National Board of Health should embrace a superintendence of the sanitary condition of the domestic animals. For this object he advises that there shall be associated with the board one or more veterinarians, whose special duties shall be to consider all matters in which the health of the lower animals affects man; "to advise as to the enactments and administration of State laws for the prevention and extinction of plagues and parasites common to man and animals; to conduct experimental researches into the source, propagation, and extinction of these disorders and parasites of animals, and to act when necessary in an executive capacity in the exclusion or control of these scourges." He also recommends that the subject relating to "the exclusively animal plagues and the parasites that affect animals only should be committed to an organization drawn from stock-owners and the veterinary profession;" and that the whole question of animal sanitation be thus placed under the direction and supervision of the National Board of Health, as the most economical, efficient, and satisfactory medium of conducting this important service.

In the discussion of the subject of cattle disease in relation to the health of man, and in relation to political economy, Dr. Verdi points out some of the common sources of danger to health from the consumption of diseased or unsound meat, and also the immense loss these diseases entail upon one of the most important industries and sources of wealth of the country; and he proposes a plan for a national organization for the prevention of cattle disease and the sale of unwholesome meat. The Government has undoubtedly a great duty to perform in regard to this matter, and it is creditable to the National Board of Health to have agitated a subject of such vast national importance, and which hitherto has been too much neglected.

A very brief preliminary report upon the Gauging of Sewers, by Col. Waring, of Newport, R. I., will be found in Appendix G. The object of the investigation is, as stated by Col. Waring, to determine the pipe capacity needed for the discharge of domestic sewage. The investigation, so far as it has progressed, has developed results which tend to sustain the view, that a system of sewers in which the sizes are adjusted to the removal of foul wastes only, is preferable from a sanitary point of view, and is likewise more economical. As Col. Waring promises to furnish an exhaustive report upon this subject, it will be judicious to withhold further comment until after its publication. We may remark, however, that upon the results of this investigation has been based the recommendation of a scheme for the sewerage of Memphis, which has been put into practical operation, whereby it has been estimated there will be a saving of \$275,000 on the first cost, in comparison with sewerage works constructed in the usual manner. The verdict of time will be awaited with much interest.

The next Appendix, marked H, is devoted to Schedules of Questions for a Sanitary Survey of Hudson County, N. J., and Bayonne, N. J. It covers sixty-eight pages of the report, and comprises questions and answers, tabular statements, statistical records, and some illustrations; the whole furnishing a very exhaustive statement of the sanitary condition of these places. The list of subjects contained in the twenty schedules embrace the following: Location, population and climate, topography, water-supply, drainage and sewerage, streets and public grounds, habitations, gas and lighting, garbage and excreta, markets, slaughter-houses and abattoirs, manufactories and trades, public school buildings, hospitals and public charities, police and prisons, fire establishments, etc., cemeteries and burial, public health laws, regulations and municipal officials, registration and statistics of deaths and of disease, quarantine, and municipal sanitary expense. The results of the survey are of very special local interest, and also possess some general value; but the main object of their presentation in the report is "to serve as suggestions to those engaged in inquiries relating to municipal sanitation, and to form the basis of reports to the National Board of Health upon the sanitary conditions of a place." Any one contemplating work of this character will profit by first consulting this instructive and comprehensive guide.

Appendix I contains the preliminary report of a special committee of the National Board of Health, consisting of Drs. J. S. Billings, H. A. Johnson, and R. W. Mitchell, appointed to conduct a sanitary survey of the city of Memphis, at the request and with the aid and coöperation of the local and State authorities. This action was rendered necessary in view of the calamitous visitation of yellow fever, which in 1878 caused 2779 deaths, and in 1879 as many as 497 deaths, in a population of 35,000 nominally, but which, in fact, is an over estimate, as an exodus of citizens occurred soon after the commencement of the disease.

The survey was conducted in the winter of 1879 and 1880, and embraced in its scope a thorough house-to-house inspection, the subjects of the water-supply, drainage and sewerage, town cleansing, removal of excreta and other waste matters, mortality records, and other questions of like importance. Upon the data thus obtained has been founded a tolerably complete sanitary history of the city of Memphis, which, as a guide to the correction of evils, was immediately productive of the greatest good, and which will serve hereafter the valuable purpose of a record for refer-

ence. Some idea may be formed of the magnitude of the work by the statement contained in the report of Dr. F. W. Reilly, inspector in charge, that the inspection returns filled 96 folio volumes, covering 9508 inspections, and the tabulation of returns 4 royal folio volumes, containing 176,433 different entries. "On these sheets it is believed every structure and individual lot of ground within the corporate limits of Memphis is succinctly described, with its sanitary history at date of inspection."

A paper by Dr. Charles Smart, U. S. A., on the practical results of an analysis of the water-supplies of Memphis and of certain towns and villages in Mississippi and Tennessee concludes the report of the committee charged with making a sanitary survey of Memphis.

Dr. P. H. Bailhache, Surgeon U. S. Marine Hospital Service, furnishes in Appendix K a report on the Hygiene of the Mercantile Marine, with certain recommendations having reference to measures deemed expedient for the improvement of the sanitary condition of this service. The report is a digest of facts obtained mainly by means of a circular letter addressed to medical officers of the marine hospital service, stationed at the principal ports of the United States. The information thus secured is classified under various headings, the principal of which relate to the ventilation of quarters on shipboard, water-supply, food, duties of officers and men, care of seamen during voyage, provision for safety in time of storm or shipwreck, the various questions relating to seamen while on shore, as habits, lodgings, shipping agents, etc., preventable diseases, physical examination of seamen, homes for disabled seamen, apprentices; also the sanitary needs on board ship, hospital accommodations, and accommodations for female and infant passengers. Then follows a brief statement of existing legislation on the subject under consideration. And the report concludes with recommendations for the improvement of the sanitary condition of the merchant marine, based upon the data obtained by the investigation. The subject is an important one, and merits earnest and thoughtful consideration.

The report of Dr. E. Harris, of New York (see Appendix L), on an outbreak of Malignant Diphtheria which occurred in May and June, 1879, in the township of Newark, Caledonia Co., Northern Vermont, presents a unique and concise history of the rise, progress, and decline of a very destructive epidemic disease among the thrifty inhabitants of a mountain district hitherto enjoying a reputation for salubriousness. The opportunities for studying the agencies and conditions by which diphtheria produces its ravages and tends to become epidemic, and for testing the efficacy of properly administered sanitary measures in preventing the contagious propagation and prevalence of the disease, were exceedingly favourable; and the occasion has been turned to fruitful advantage by timely and intelligent investigation. The results of the inquiry, as presented by Dr. Harris, show that diphtheria is liable to appear in almost any region, from causes which are as yet imperfectly understood; that the virus being present, the virulence of the infection and the malignant progress of the disease are greatly intensified by the presence and coöperation of insanitary conditions; and that its contagious propagation and malignant prevalence may be prevented or restricted by the timely adoption of adequate sanitary measures. The experience gained by this recent and severe outbreak of diphtheria is a fresh argument showing the necessity of the establishment of a central authority charged with a supervision of the sanitary interests of the State, and always ready to advise and direct measures for the safety of the people in time of imminent peril.

As provided for in the constituting act, the National Board of Health has advised with the principal sanitary organizations and sanitarians in the United States and with the National Academy of Sciences, relative to the best plan for a national public health organization, the subject of quarantine, both maritime and inland, and the relations which should exist between State and local systems of quarantine and a national quarantine system claiming especial attention. The results of the consultations and conferences, briefly summed up on pages 6, 7, and 8 of the report, have established a clearer conception and knowledge of the whole subject than could otherwise have been obtained, and have been largely influential in determining the character of the operations of the board, and in giving shape and support to their recommendations.

Special attention has been given to the elaboration of a system of quarantine regulations, agreeably to the provisions of an act approved June 2, 1879, entitled, "An Act to prevent the introduction of contagious and infectious diseases into the United States." Rules and regulations as contemplated by the act were prepared without delay, and approved by the President, June 26th (see Appendix M); but, unfortunately, they were rendered inoperative by the unwillingness of the authorities of certain ports where contagious or infectious diseases had existed or did exist to permit of their official promulgation, and also by the refusal of captains or owners of vessels at several ports of other powers to supply themselves with the bills of health required by these regulations. This failure in administration proved conclusively the need of an international system of quarantine, and accordingly the initiatory steps were immediately taken for convoking an international congress for the purpose of securing, "by international agreement, a reliable and satisfactory system of notification as to the actual sanitary condition of maritime ports so far as regards the existence of contagious and infectious diseases in such ports."

Without such coöperation no satisfactory system of maritime quarantine is possible, and no effort should be spared to secure it.

In addition to the rules and regulations above mentioned, the board prepared certain sanitary regulations for quarantine stations, vessels, railroads, etc., which were issued to State and municipal health authorities, and have been adopted with advantage by a number of State and local boards of health (Appendix N). The experience gained by the rigid test of the first summer suggested modifications and improvements in these rules, which have since been made, after consultation with State and local authorities. The effort of the National Board to perfect, so far as practicable, a uniform system of inland and maritime quarantine regulations, to take the place of the various conflicting, and, in many cases, inefficient regulations prescribed by the different State authorities, is a movement in the right direction, and its progress leads to the belief that it will eventually meet with general approval.

As a preliminary to a full knowledge of the actual conditions and necessities of the various quarantine stations of the Atlantic coast and Gulf of Mexico, it was early determined to employ a number of inspectors charged with the responsible duty of investigating the sanitary condition of these places, and of observing the practical operation of the quarantine regulations.

The results of these observations and inquiries have been embodied in a series of reports which are presented in Appendices, marked O and P, the latter specially relating to the quarantine at New Orleans. These

reports cover the remaining 170 pages of the volume. It would be impossible with our limited space, and indeed is unnecessary, to go into the details therein presented; it will suffice our object to refer to some of the leading features and prominent recommendations. It is not expected, in so extensive an undertaking as that embraced in an investigation of the sanitary condition and necessities of the ports of the entire Atlantic and Gulf coasts, that the work would be exhaustive. Sufficient, however, has been obtained to serve as an intelligent guide for the National Board in directing future quarantine measures, and to form a valuable record for reference.

Special attention is called to the able report of Dr. Elisha Harris, embracing the district from Portland, Maine, to New York City. It would appear that a portion of the report has been omitted, and that certain data for which space has been reserved, have never been supplied. With the exception of these defects, the report with its large number of maps and charts (25), and numerous diagrams, is a very creditable document, which will be of great value for future reference. In its scope and fulness, it partakes somewhat of the nature of a sanitary survey. The geology, sanitary topography, drainage and sewerage, water-supply, town cleansing, statistical records, sanitary government, and quarantine history with special reference to yellow fever and cholera, are alluded to sufficiently in detail to give one a very good general knowledge of the subject. The experience gained by the investigation leads to the conclusion, that the danger to the public health in ports and cities on the North Atlantic coast is far more perilous from local sources of disease than from any causes which lie beyond local control; though there is none the less need of maintaining the proper sanitary defences against the introduction, distribution, and propagation of disease from without. The conclusions on pages 328-331 will be read with advantage.

We regret that we are not able to speak as favourably of some of the other reports. Those embracing New York City, Philadelphia, and Baltimore, by Dr. E. M. Wight, furnish merely a brief description of the quarantine stations, the plan of their management, expenses, etc. Fuller descriptions of the remaining stations on the coasts with some allusion to their sanitary conditions and surroundings, and the more pressing needs of the quarantine service, are furnished in the rest of the papers. Some of these are disjointed and fragmentary, and partake more of the nature of a collection of correspondence rather than a clear, concise, and systematic presentation of the results of the investigations. The crude material has, however, been furnished in abundance, and he who is sufficiently interested in the subject to devote the time necessary for culling out the most important facts, will be amply rewarded.

The common evils of the day, such as bad drainage and sewerage, unsatisfactory and neglected removal of refuse matters, impure water-supply, pollution of air, soil, and drinking-water by storage of excreta upon the premises, bad pavements and inefficient street cleaning, are no exceptions in the ports and places visited on the South Atlantic and Gulf coasts. These insanitary conditions are the chief influences which threaten the public health, and tend to favour the propagation of diseases which are occasionally introduced from other localities. In no places were the quarantine defences found abreast with the requirements of the times. In some instances, Dr. Bell, the sanitary inspector, was able to suggest improvements, which were courteously received and adopted. In others, the

data collected, and recommendations were referred to the National Board of Health for more deliberate consideration.

The remaining reports refer to the sanitary inspection of places on the Atlantic coast of Florida, and on the Gulf coast from Key West to the Rio Grande. The inspections were made by Drs. Elliott, Cochran, Palmer, Johnson, Pope, Wight, and Bell. In some instances, there are reports on the same places by several different officers. The special interest centred in this portion of the coast line on account of its association with the history and spread of yellow fever, and the facilities for intercourse with Cuba, necessitated a very thorough examination, even of places of small population and of little commercial importance.

The results of these investigations demonstrate conclusively the necessity of national supervision over quarantine regulations, as conducting to, and securing, a more uniform, efficient, unprejudiced, and least onerous and expensive administration of the offices of quarantine stations. Such supervision is particularly applicable to stations situated at, or controlling the entrances to the great commercial highways of the country, through which, mainly, contagious or infectious diseases are liable to be introduced from abroad; as, for example, at the mouth of the Mississippi, at Key West, on the south Atlantic coast, at the mouths of the Chesapeake and Delaware Bays, and at New York and Boston harbors.

The whole report is a very commendable production. The tardy publication of the volume would have been more objectionable had not the weekly bulletin already supplied much of the information now compiled in this work. A more extended index would have been appreciated by the reader. The proof-reading might have been more accurate, and the mechanical execution of the book more creditable. With these exceptions, we have nothing but praise to bestow upon this record of the results of the first year's labours of the National Board of Health.

W. H. F.

ART. XXII.—*On Cancer of the Breast.* By THOMAS WILLIAM NUNN, F.R.C.S., Eng.; Consulting Surgeon to the Middlesex Hospital. 4to. pp. xiv., 230. London: J. & A. Churchill, 1882.

SUCH books as this one can only emanate from the elders in the profession, and it is eminently fitting that from them such volumes should come. Its conclusions are based upon a wide experience, and are therefore entitled to a most respectful consideration, while the practical tone of Mr. Nunn's remarks, both upon theory and practice, cannot fail to commend them to those who are interested in the subject.

We propose to follow Mr. Nunn through the practical portion of his work in some detail, treating the theoretical and pathological part with less minuteness, not as less important, but as less firmly established, and still *sub judice*.

In a brief and tersely expressed introduction of some fourteen pages, Mr. Nunn has given his views upon the nature of cancer. He regards it as essentially an ineffectual effort at development which ends in the production of tissue monstrosities, in which there is no order, but all is in con-

fusion, the very varied appearances presented being in fact divergences of normal tissue, modified by exaggeration, by defect, by malposition, or by eccentric combination. Mr. Nunn thinks that the latest researches do not enable us to go further in our definition, and that while the course, progress, and termination of the disease have been made plain by observation, it yet remains to be determined how it begins, and what are the starting-points from which ensue the modifications of normal structures.

It is the opinion of our author that a more efficient and valuable classification of cancers will be obtained by striving to mark the points of resemblance existing between the different forms, rather than by directing attention to the differences so evidently existing. In this way we may get back to the starting-point, to the initial and essential lesion. We know that embryonic development proceeds from a simple cell, and as we account for the varied appearances presented by cancers upon the theory that it is essentially an attempt at development, we may hope yet to trace the disease back through all variations to its beginning.

Establishing himself upon this hypothesis, made highly probable by observation, Mr. Nunn is inclined to look upon cancer in any part as a modification of that part rather than as something extraneous or heterologous. As the human organism is composed of an aggregation of units, which may at any time be deformed by accidents, or unknown causes, and which all ultimately terminate in degeneration and death, so the as yet unknown influential cause of cancer may at any time bring about this deterioration of form, and retrograde change in any part.

Despite the very varied appearances presented by cancer in the different tissues, microscopical investigation enables us to demonstrate certain invariable characteristics. Thus, whenever we find cancer, we find innumerable cells in the stroma of the organ, with very active reproductive, and but very little developmental power; we find an active attempt to reproduce tissue like that of the organ in which the disease exists, but the attempt is abortive, has stopped short of perfection, premature degeneration has been established, and a grim caricature of the normal process has resulted. Not only has the new cancerous tissue a strong tendency to atrophy and death in itself, but by its encroachments, and by the stimulus of its presence, it provokes the remaining normal tissues to similar action, and we have atrophy, molecular death, and gangrene, *en masse*, of the part.

Thus, while we have been compelled to relegate the typical "cancer-cell" to things of the past, and to recognize the fact that the normal cells of any part may become the progenitors of cancer-cells, we are yet able to maintain the identity of cancer, by its invariable characteristics and results.

After a graphic description of the cellular elements to be found in cancers, and the development of their fibrous stroma, Mr. Nunn goes on to give his reasons for thinking that we need not hesitate to assign tumours of the most different degrees of density to the same fibrous—connective-tissue—origin, when we recall its universal presence even in the most diverse normal organs. Nor does he think that the question of an epithelial, or epidermic, origin need present any difficulty in view of their close histological relation in normal parts. For, while admitting the inherent difference between epidermic and epithelial cells, he maintains that not only is there no antagonism, but a real reciprocal alliance between them. To support this he instances their union in the ovum, and the lining of a newly formed bursa, and other serous surfaces, with epithelium, which presumably must have at least a close connection with connective-tissue

cells, if it does not originate from them. At any rate they do not appear to be in any way antagonistic to each other.

While certain forms of cancer classified and described as such sometimes exist almost alone, and go to form the mass of some tumours, in very many cases these varieties are found to exist together in the same tumour. This fact causes Mr. Nunn to ask with much pertinence whether they should not all be classed together as cancer, modified by the tissue peculiarities of the part involved. In them all, however, we find the one invariable fact, that with great reproductive activity there is deficient developmental power, and we have the continued growth and the continued death, which in greater or less degree seems to be the leading characteristic of cancer.

Passing from Mr. Nunn's introduction we come to the first part of his work, which he denominates "Clinical and Pathological." Mr. Nunn's experience, coinciding with that of other observers, shows that the breast and the womb are the most frequent seats of cancer, although the proportion of cases of disease in either part will vary somewhat in different series, from peculiar circumstances. Thus, in 268 consecutive out-patient cases, Mr. Nunn noted 157 cases of cancer of the breast, and 47 of the womb; but of 1000 cases observed in the In-patient Cancer Department of the Middlesex Hospital, the proportion was different, 260 being of the breast, and 389 of the womb. In a foot-note it is explained that this difference may be accounted for from the fact that cases of cancer of the womb are admitted into the Middlesex Hospital from, probably, all the other hospitals in London.

Of 160 cases observed by Mr. Nunn, the average *age* of attack was 50.4, and, on page 161, he prints an analysis of his cases into quinquennial groups, compared with the average number of persons living at the respective ages. This comparison does not materially alter the results, and the greatest liability is shown to be between the ages of 45 and 49 inclusive, when the percentage rises as high as 18.006. That is, taking Mr. Nunn's 160 cases as a basis of calculation in 100 cases of cancer the disease will be found to make its attack between the ages of 45 and 49 years in 18.006 cases.

Under the head of *diagnosis*, Mr. Nunn speaks of cachexia as perhaps existing, even though it be with a "look of healthiness." Now it seems to the reviewer to be an error to allow cachexia a place among the symptoms upon which a diagnosis must depend. No doubt, in advanced stages, we find a cachectic condition, as we do also in many diseases accompanied with exhausting discharge; but the symptom has then lost all diagnostic value. Nor do we see that the "look of healthiness," to which Mr. Nunn refers as existing with cachexia, has anything to do with the matter, for certainly, if the patient looks healthy, her appearance will not aid us in arriving at a conclusion that she is suffering from cancer. Mr. Nunn has found severe pain to accompany acute cancers; while those cases which are less active may be, and often are, entirely free from it. There is another circumstance which cannot be lost sight of by the surgeon who would base a diagnosis upon so subjective a symptom as pain, namely, the varying sensitiveness of different patients, and the difference which exists in the descriptive language used by them.

In *Retraction of the Nipple and alteration of its level*, we have a symptom which, as Mr. Nunn very well shows, is of the utmost value. Thus, the nipple of the affected side will be found not only retracted, but it will

approach more nearly to the clavicle than its fellow of the opposite breast. The author of this volume says, that where this elevation has existed, he has not known cancer to be absent. Coloured discharge from the nipple he regards as very suspicious, and eczema of the nipple and areola, or that which is described as such, as another evidence of the beginning of a cancer. It will be remembered what stress Sir James Paget lays upon this fact, and how he regards it as an almost invariable precursor of cancerous disease.

Great caution is advised in giving a prognosis, as Mr. Nunn's experience has taught him that it is at first impossible to say how long will be the duration of a given case—it may be twenty years before a fatal issue is reached, or, on the other hand, the progress of the disease may be rapid, and the case terminate within twelve months.

Speaking of the progress of cancer of the breast, Mr. Nunn points out that, with all the variations which may be observed, the process is unchanged, and deposition and destruction, hypertrophy and atrophy, go hand in hand. The beautifully executed plates at the end of the volume well and faithfully present this fact. Besides the contamination of the axillary glands, and the extension of the disease to the thoracic cavity, which he regards as impending processes, Mr. Nunn speaks of the secondary affection of the cerebro-spinal system as rare, yet as comparatively more frequent in those persons who have the most highly developed nervous systems.

Upon the subject of surgical interference our author holds decided ground. Although not adhering to the theory of the local nature of cancer, he does not hesitate to advocate the removal of the tumour in selected cases. He does this upon the same basis of reasoning as is adopted by Mr. Birkett and others, that by operating we are doing at once, and speedily, what nature is striving to do by a long and painful process; that the comfort of the patient is promoted; and that in some cases there is great prolongation of life obtained thereby. The opponents of an operation hold tenaciously to the opinion of Brodie, based upon a most extended experience, that the average duration of life is shortened by removing mammary cancers, but most surgeons have met with cases in which a long immunity from the disease has followed an operation, or where its return in some internal organ has led to a comparatively painless death. It is in the hope of obtaining these advantages that Mr. Nunn counsels an operation in selected cases. Where an operation is done he is most decided in advising that the entire breast be removed; that, if necessary, the disease should be followed into the axilla; and, above all, that the incisions should be so arranged, if possible, as to allow of and insure free drainage. The hemorrhage should be efficiently controlled, and the wound dressed as speedily as practicable, its edges being brought into accurate apposition by means of sutures. While he regards the antiseptic method as yet in its infancy, and looks forward to future developments in that direction, he does not think that the spray, or rigid Listerism, is required. He has himself had much satisfaction in the use of dilute sulphuric acid as a dressing, and his observation leads him to conclude that the value of the chloride of zinc applications, at one time advocated by Mr. De Morgan, consist in their antiseptic properties. Considerable space is devoted to a consideration of Dr. Fell's method of extirpating cancerous tumours by chloride of zinc paste. This plan Mr. Nunn has tried, and save that it does not necessarily confine the patient to bed, seems to possess no advantages, and some very decided

disadvantages. It may be well to briefly describe the process here, that some of our readers who may come across patients possessing an invincible repugnance to the knife may resort to this Fell process (no pun is intended). First, the skin over the whole area of the tumour, and beyond, is thoroughly acted upon by the strongest nitric acid, for which step of the procedure, of course, the administration of an anæsthetic is required. The next day, into the tissue thus hardened by the acid, shallow incisions are made, parallel to and about half an inch distant from each other, and into each incision is packed a strip of muslin loaded with the chloride of zinc paste. These incisions are sufficiently numerous to cover the whole area of the growth. The process of deepening these grooves and packing them is repeated daily, until the depth of the tumour has been reached, when any slight attachments remaining are divided, and the whole sloughing mass is removed. Mr. Nunn has found this process in some cases painless, while in others the pain is severe and continuous, and he has not found any greater retardation of a return of the disease or a greater prolongation of life to result from any caustic process, than he has obtained by using the knife. Electrolysis, and the much-vaunted injection of acetic acid have neither proved themselves to be superior methods of treatment, in Mr. Nunn's experience.

In the treatment of the cancerous sore, Mr. Nunn has made use of many articles, both to allay irritation and diminish fetor. Iodoform, to which he gave a fair trial, disappointed his expectations, and he seems to have had more satisfaction from the use of a weak solution of sulphurous acid, applied by irrigation, than from any other, though he does not reject the use of some other disinfectants.

The remainder of the first or "Clinical and Practical" portion of the book is taken up with the narration, in more or less detail, of sixty illustrative cases. The duration of the disease in these cases varied from one to nearly twenty years. It seems to the reviewer that, in view of the long continuance of many cases of cancer, there is one important fact deducible, *i. e.*, that patients attacked by cancer, even while they know that the disease is incurable, should be encouraged to regard themselves as invalids, who, with care and nursing, may have many years of comparatively useful and comfortable life before them. Many persons afflicted with cancer may, and do, die of other diseases. It is, therefore, happy for them if they can avoid despondency, and, even while they know that the doom of death has been pronounced upon them, recognize that such a doom, so far as this world goes, impends over all; while they know that their own sentence has been pronounced, they may be assured that the same sentence will be executed upon many around them without the same formal notice.

Mr. Nunn prints tables showing the post-mortem appearances in one hundred and twenty-three cases of mammary cancer, which present some interesting facts, and are worthy of special study. We think it was an error not to furnish a summary analysis of them.

The second part of this work is designated as "Pathological and Speculative." We have read it carefully, and have felt repaid for the perusal, but the growing dimensions of this notice warn us to hasten to a conclusion. Then, as we have before stated, very many points in the pathology of cancer are as yet unsettled, and we know hardly anything more disheartening than, after having mastered the abstruse theory of an eminent pathologist on one page, to find, upon turning the leaf, that the whole scheme is pronounced and demonstrated to be a fallacy by a later and

equally distinguished observer. We shall, therefore, merely note one or two observations of our author, and feel that we have presented his own theoretical views with sufficient fulness in our analysis of his introduction.

Smokers will be glad to know that Mr. Nunn does not believe that the tobacco-pipe can produce a cancer where the predisposition does not exist. An interesting feature is a cancer-map of England, showing the birth-places of patients suffering from the disease, and proving the statements of Mr. Moore and Mr. Haviland, that it is much more prevalent in the southern part of the island.

In this part of the book will also be found a very valuable summary of the views of many distinguished modern English and European authors. In an appendix, space is given to an exceedingly interesting abstract of the important discussion upon cancer at the London Pathological Society, in 1874, which is also conspicuous for the very widely different opinions expressed by some of the best men in the profession who took part in it.

It remains for us but to speak of the illustrations which conclude the volume. They consist of twenty-one coloured lithographs, six being portraits of the gross appearances in typical cases of cancer of the breast, while the remainder represent the microscopical appearances of cancer in various parts of the body. They are admirably executed, and are in keeping with the general appearance of the volume, which, with its good print, liberal margin, and heavy paper, is entitled to a place among the handsomest of recent surgical publications.

S. A.

ART. XXIII.—*A Manual of Obstetrics.* By A. F. A. KING, M.D., Professor of Obstetrics and Diseases of Women and Children in the Medical Department of the Columbian University, Washington, D. C., and in the University of Vermont, etc. etc. 12mo. pp. 325. Philadelphia: Henry C. Lea's Son & Co., 1882.

THIS small duodecimo volume is one of the smallest and most condensed of all the *multum in parvo* obstetrical treatises which have come under our observation in several years past. As it is confessedly prepared in large measure from the standard works of Professors Playfair, Leishmann, and Lusk, its merit as a manual depends very much upon the power of condensation possessed by its author, and the closeness of his adherence to the teachings of these three obstetricians. For an ability to convey instruction in few words, we will give Prof. King all due credit, as in this respect his little book is quite a success. We will, in our examination of it, however, point out a few sections which appear to require attention.

The cause and prevention of perineal laceration is treated by the author according to the views of some of our best writers; still he does not reach the root of the matter entirely. Why does the perineum give way? This is a question that has several answers according to circumstances. Take an actual case. A lady was five times delivered with care in this city by an able accoucheur, by the aid of the forceps, without any giving way of the perineum. On a sixth occasion she delivered herself hurriedly and alone of a small child, and tore her cervix open, and her perineum into the

rectum. Here the parts must have become lacerated, because they had not had time to perfect the softening process which takes place in them during the progress of labour. Although supporting the perineum, as formerly taught, may not be required, laceration may often be prevented by resisting the passage of the child during a pain or two, and at the same time cautioning the mother not to bear down. When violent uterine and abdominal contractions come on, with an irresistible inclination to bear down, the exit of the head must be resisted by the accoucheur, if he finds the perineum thinned under the pressure until almost on the point of giving way. After such a distension, the parts will yield with safety in a pain or two. After such a narrow escape, there is a second danger to be apprehended from the unequal pressure produced in the delivery of the sacral shoulder. Take another case. We have recently been consulted in one where rupture took place in the birth of a first child to such an extent as to tear up the rectum about three inches. The fœtus was a female of ordinary size, but the vulva of the mother was unusually small, and the vulvo-rectal space very short. Had the parts been pared and sewn up an inch and a half from the anus, the vagina would have been nearly closed. Besides a disproportion between the head of the fœtus and the vulvar outlet, there is the toughening of the parts produced by age; and in some instances a weakening of the tissues of the perineum. In the last event, claimed by many observers, there is no measure of prevention that will avail.

It is hardly worth while to mention the subject of symphysiotomy in a manual; but as the author has, we must correct him when he says, "that it has been abandoned and become obsolete," page 191. There were forty-nine operations as far as known in the world during the first era of this method of delivery, and there have been fifty in Naples since its revival in 1869.

Of the Cæsarean section he writes (page 192): "The percentage of maternal recoveries, *under the most favourable circumstances*, is roughly about fifty per cent. The results of statistics notably unreliable." In our own country the recoveries under the circumstances named have been seventy-five per cent. In Great Britain scarcely above the average of all their cases. The reliability of our American statistics is defended in a special article in this number. Those of Continental Europe are such as he claims.

The Porro operation is not such as he describes on page 195. He says: "The ovaries also are sometimes taken out." Porro calls his modification a "utero-ovarian amputation." The cervix is not transfixed and wired each way in the original operation, but surrounded by a wire loop tightened in the *serre-nœud* of Cintrat. The broad ligament also is not cut on either side of the uterus. The number of operations, as far as ascertained, is eighty-four, and recoveries thirty-seven.

For the relief of ante-partum hourglass contraction of the uterus, he does not mention the claim that has been made for success with the nitrite of amyl.

The volume is neat in appearance, well illustrated, and will answer as a remembrancer for students of medicine and those wishing to hurriedly refresh their memories on obstetrical manipulations and methods.

R. P. H.

ART. XXIV.—*Transactions of the American Ophthalmological Society. Seventeenth Annual Meeting.* 8vo. pp. 317. New York, 1881.

THE first paper is by Dr. WM. F. NORRIS, of Philadelphia, *On the Administration of Anæsthetics in Bright's Disease of the Kidneys, and on Some Cases of Sudden Death after Cataract Operations*, in which the author records two cases of death supervening unexpectedly after operations for cataract. "They present four features in common: 1st. They were both anæsthetized with sulphuric ether; 2d. They entirely recovered consciousness; 3d. They died comatose—one a few hours, the other eighteen days after the operation; 4th. In both cases a careful autopsy revealed no organic lesion, except Bright's disease of the kidneys;" and both deaths are attributed to the same cause—congestion induced in diseased kidneys by the administration of ether.

The first case was that of a child five months old. The patient recovered consciousness sufficiently to nurse, but remained fretful, and two hours after the operation, had a convulsion, followed by others, and died comatose in four hours. The only lesion found, on *post-mortem* examination, was fatty degeneration of the kidneys. Reference is made to statistics, which prove that Bright's disease of the kidneys is not infrequent in infants.

The second patient was a lady sixty-eight years old, apparently in good health. She recovered readily from the anæsthesia, and the eye did well, but there were unfavourable general symptoms—slight fever, thirst, quick pulse, coated tongue, and diminished quantity of urine, passed frequently.

The urine had a specific gravity of 1008, and contained a small amount of albumen, and the microscope showed fatty and granular casts. Death, preceded by coma, occurred on the eighteenth day after the operation, and the kidneys were found to be decidedly granular.

A case is also reported in which a patient with fatty kidneys died twelve days after an operation for cataract, performed without anæsthesia, and the importance of this kidney complication in all operations for chronic diseases is discussed.

In a report of *One Hundred Cases of Cataract Extraction with a Single Failure; with a Discussion of the Advantages of Non-Anæsthesia in this Operation*, Dr. HASKET DERBY, of Boston, gives the statistics of two hundred cases of cataract operated upon with ether and of a similar number without ether. Of the 1st class there was in 81 cases vision of $\frac{1}{10}$ or more; in 8 cases $V. = \frac{1}{12}$ to $\frac{1}{60}$; in 2 cases result still undecided; and in 9 total failure. Of the 100 patients operated upon without ether, 89 gained vision of $\frac{1}{10}$ or more; 9 from $\frac{1}{12}$ to $\frac{1}{60}$; one awaited a secondary operation; and in the case of one only was the operation a total failure. This is an unusually good showing, and is strong proof so far as it goes; but more extended statistics will be necessary to make out a positive case against anæsthesia. Dr. Derby uses eserine before operating, and insists that, unless some complication demands it, the eye should not be opened for at least a week after the operation.

Dr. B. JOY JEFFRIES discusses *A Peculiar Expression of the Eyes of the Colour-Blind*, to which attention was called some years ago by Professor Wilson, of Edinburgh, but which has not been mentioned by any other of the now very numerous writers on the subject of colour-blindness. As we have failed to seize upon anything definite which would enable us

to describe this expression, we must let the authors speak for themselves. Professor Wilson says of four cases, considered somewhat typical: "One has an absent, anxious glance, with something of the expression which amaurosis gives, only the pupil is small. One has a startled, restless look. The other two have an eager, prying, aimless air. The character common to them all, and to the others I have seen, is this aimlessness of look." Dr. Jeffries adds to this that "there is a certain liquid look to the eyes, as if slightly suffused." Professor Wilson invokes the aid of Macbeth to describe it, with—

"Thou hast no speculation in those eyes
Which thou dost glare with,"

while Dr. Jeffries, with the practical tendency attributed to his countrymen, illustrates the effect of this peculiar look by an anecdote of a colour-blind schoolmaster, who, by means of it, promptly quelled the turbulence of a hall full of roistering boys.

We are not prepared to deny that this very peculiar expression is a scientific fact, but are inclined to think that its recognition will require a good deal of experience and, perhaps, some enthusiasm.

Dr. WM. S. LITTLE, of Philadelphia, reports *A Case of Persistent Hyaloid Artery*, with excellent illustrations by Dr. J. M. Taylor. Dr. L. thinks that the vessel, which doubles upon itself and joins the retinal vessels, contains blood.

Dr. JOHN GREEN, of St. Louis, Mo., describes *An Operation for Closed Pupil with Anterior Synechia, using the Pince-ciseaux of Wecker*. The anterior chamber was opened by means of a Graefe cataract knife, the synechia was divided with the Wecker scissors, and one blade of the instrument was passed through the opening thus made in the iris, and the iris, lens-capsule, and newly formed tissue were cut by a single closure of the blades. Useful vision was obtained.

A case of *Congenital Paralysis of both Abducens and both Facial Nerves* is reported by Dr. G. C. HARLAN, of Philadelphia. The complete congenital paralysis of these two nerves, widely separated in their course after they leave the brain, points to a central cause, and supports the view that they arise from the same nucleus; while the preservation of taste with complete paralysis of the facial indicates that the deep origin of the chorda tympani is not the same as that of the facial.

Dr. CHAS. STEDMAN BULL, of New York, in some remarks on *The Treatment of Scars of the Face involving the Eyelids, directly or indirectly*, discusses some of the common causes of failure in operations upon such cases, and insists upon the importance of preparing the parts by massage, traction, subcutaneous division of adhesions, etc.

A Source of Danger in the Frame of the Eyeglass as commonly manufactured is exposed by Dr. F. B. LORING, of Washington, D. C. Dr. Loring reports two cases, one ending in loss of the eye, in which injury was inflicted by the small spike—which is always placed on the inner side of the handle of the frame as a means of locking the glasses together when closed—being driven into the eye by a blow. He recommends that this catch be removed entirely in those cases where the patients wear their glasses constantly, and that it be placed on the outer side of the frame when used at all. The soundness of this advice is beyond question, and it is to be hoped that this valuable little practical suggestion will not be unheeded.

A Case in which Useful Vision was maintained through a number of years by the aid of a totally dislocated Lens, is reported by Dr. SAMUEL THEOBALD, of Baltimore. The lens, which was quite transparent, was found to be dislocated directly downwards and to be lying some distance below the pupil. By bending his head well forward and turning his face towards the floor, thus bringing the lens into the axis of vision, the patient could read No. 1 of Jaeger's tests (diamond type). His distant vision was brought from $\frac{1}{200}$ to $\frac{2}{70}$ by a $+\frac{1}{7}$ glass.

The convexity of the lens was found to be quite equal to that of the normal lens in full accommodation—a fact which supports the Helmholtz theory of the mechanism of accommodation, according to which the increase in the convexity of the lens in near vision is accomplished by the action of its elastic capsule, when freed by the ciliary muscle from the restraining influence of the suspensory ligament.

Dr. S. D. RISLEY, of Philadelphia, in a discussion of *The Comparative Value of the Mydriatics*, gives the following conclusions:—

“That the sulphates of atropine, duboisine, and hyoscyamine are efficient agents for paralyzing the accommodative function, and in the treatment of asthenopic eyes. That, in the employment of the last three named, the duration of the treatment is very much shortened. That, for the correction of anomalies of refraction, in otherwise normal eyes, the homatropine is to be preferred. That, if retino-choroidal disturbance is also present, hyoscyamine or duboisine are preferable; to atropine, because of the shorter duration of the treatment; to homatropine, because of their more persistent control over the ciliary muscle. That hyoscyamine is preferable to duboisine, since the tendency to systemic poisoning is not so great.”

Dr. CHARLES J. KIPP, of Newark, New Jersey, reports *Two Cases of Sarcoma of the Choroid, presenting unusual Clinical Features*. Their peculiarity consisted chiefly in the absence of increased intraocular tension, and the fact that there was but very limited detachment of the retina.

Dr. F. BULLER, of Montreal, Canada, reports *A Case of Sudden and Complete Loss of Vision after large doses of Quinine*. The patient was a lady, 34 years of age, previously in good health, and the quinine was given on account of symptoms of septicemia occurring five days after child-birth. Two 20 gr. doses were taken in the first 24 hours, the same on the second day, and three such doses on the third day. On the fourth day the fever and delirium had passed off, but the patient was found to be absolutely blind. There had been tinnitus and some deafness after the first two or three doses, but it had passed off. The pupils were widely dilated and immovable. The ophthalmoscope, at first, revealed no decided change in the fundus, except a bluish-gray haziness of the retinae, most marked at the maculae. Later the optic disks were pale, and the retinal vessels much contracted. As vision returned there was concentric limitation of the field. Central vision was completely restored, but some limitation of the field remained, and the ophthalmoscopic changes were permanent. The author thinks that sudden blindness from cinchonism may be attributed to rapid effusion into the lymph spaces around the optic nerves.

Dr. J. P. WORRELL, of Terre Haute, Indiana, reports *A Case of Marked Narrowing of the Field, with diminished Acuity of Vision, following the use of Duboisia, and presumably a result of the use of that drug*. This condition, which followed the application of duboisia to healthy eyes for the purpose of determining the refraction, lasted for several weeks.

Dr. G. C. HARLAN, of Philadelphia, describes a *Case of Intermittent Concomitant Convergent Strabismus*. The regularity of the intermissions, which were of the tertiary type, continued with the greatest exactness for more than a year, when the squint appeared irregularly, and finally became constant. There was very little hypermetropia, and glasses were without effect.

A Case of Hemorrhage near the Macula Lutea, from Concussion, is reported by Dr. D. B. ST. JOHN ROOSA, of New York. The patient was struck on the right lachrymal sac by a bullet, which passed downward, under the skin and muscles, and lodged about a quarter of an inch below the glenoid fossa. Vision was not much affected at the time, but was decidedly impaired a few weeks afterwards. When the patient was seen by Dr. R., V. = $\frac{1}{2} \frac{6}{00}$, with central scotoma. The ophthalmoscope showed a red patch with displaced pigment about it, just below and involving a part of the macula. The eyeball was merely grazed by the bullet, and the author considers that the damage to the retina or choroid, or both, was due to concussion.

Dr. O. F. WADSWORTH, of Boston, discusses the subject of *Optico-ciliary Neurotomy*, and gives the histories of 15 cases in which he has performed the operation. The arguments for and against this operation, for which much was promised at first, but which has lately rather fallen into disrepute, are fairly given, and the author concludes that it offers sufficient advantages to make its employment not only justifiable, but advisable in many cases. He is, however, inclined to limit its applicability within narrower bounds than those proposed by some of its advocates.

Dr. JOHN GREEN, of St. Louis, contributes a paper *On Some Therapeutical Effects of Pilocarpine*. He thinks it useful "in asthenopia of young persons, unconnected with any considerable grade of ametropia, and in which pain or a sense of fatigue is the prominent symptom," and "in cases of impairment of accommodative power, induced by causes transient in their operation, but in which the accommodative disability may continue after the exciting cause has ceased to act." He uses it in connection with a systematic course of reading, instilling one drop of a solution of the muriate (gr. j or ij to $\frac{3}{4}$ j) some hours before the reading is commenced. He thinks it may also be indicated in the earliest stages of strabismus convergens and in certain cases of phlyctenular and vascular affections of the cornea. He considers it more easily manageable than eserine, and less likely to cause painful spasm of the accommodation.

Dr. H. D. NOYES, of New York, exposes the fallacy of *The so-called Cure of Cataract by Electricity*, as illustrated by the history of a reputed case which he had the opportunity of observing. There was an improvement in the general health and a clearing up of haziness of the vitreous, though these results were not attributable to the use of galvanism, and vision became less foggy and more satisfactory to the patient. The opacity of the lenses, however, had increased during the galvanic treatment, and vision, as tested by the types, had diminished.

In another case of cataract, galvanic treatment had resulted in suppurative keratitis with ulceration of the cornea and iritis with adhesions.

Dr. NOYES also reports a case of *Pulsating Exophthalmos*, in which a novel plan of treatment was adopted with success. A projection at the inner and lower angle of the orbit proved to be a distended vein, and this was traced back and tied up at the sphenomaxillary fissure. The

author thinks that the primary lesion was a communication between the carotid artery and cavernous sinus, causing distension of the inferior orbital vein, and that the ligature of this vein resulted in a clot extending to the sinus.

In a case of *Pulsating Tumour of the Orbit*, reported by Dr. HENRY S. SCHELL of Philadelphia, post-mortem examination revealed a gliomatous tumour, nearly filling the left side of the anterior fossa of the cranium, and extending into the orbit through a perforation in its roof. "Although the anterior lobe of the cerebrum on the left side, including the third frontal convolution, was almost diffuent, the faculty of speech was preserved to the last." The ophthalmoscope had shown well-marked "choked disk" in each eye.

Dr. NOYES describes a *Modification of Snellen's Forceps for Entropion Operations*, and Dr. RISLEY *A New Trial-glass Frame* devised by B. Alexander Randall, of Philadelphia.

G. C. H.

ART. XXV.—*A Pocket-Book of Physical Diagnosis for the Student and Physician*. By EDWARD T. BRUEN, M.D., one of the Physicians to the Philadelphia Hospital, and Dispensary of the Children's Hospital; Demonstrator of Clinical Medicine and Lecturer on Pathology of the Urine, in the Univ. of Penna., etc. etc. With wood engravings. 12mo. pp. xv., 250. Philadelphia: Presley Blakiston, 1881.

ALREADY we have several excellent works on physical diagnosis. They do not all bear a similar title; but they teach the same things in somewhat different language, and with more or less full details and differences with respect to the number and value of their illustrations. We have only to mention the names of Da Costa, Flint, Loomis, and Finlayson to prove our statement. There are others equally good which come to us from the continent of Europe, viz., those of Guttman, Barth & Roger, and Lasègue. Still we are prepared to give a hearty welcome to another, which supplies a want, or which by its contents shows care in execution or originality in manufacture. Dr. Bruen's is a small, handy volume, well printed, with a few not very good wood-cuts, presenting some inaccuracies. In his introductory chapter, he gives a fairly clear and good anatomical description of the thoracic organs and abdominal viscera, and shows how much abnormal conditions of the latter may influence the results obtained by physical examination of the chest. We object, however, to expressions like "morbid physiological status" of organs (xv.), and several others that seem to us as being apt to disturb the comprehension of the ordinary student. The work is divided into two parts: the first treating of diseases of the lungs, bronchial tubes, pleura, and mediastinum, in fourteen chapters and 158 pages; the second of diseases of the heart and pericardium in 94 pages. The first two chapters are devoted to methods of diagnosis, more particularly to percussion and auscultation. We consider the description of the manner and rules governing the art of percussion well given. The subject is always a difficult one for beginners, and requires to be well handled in order to be properly understood. We are glad that Dr. Bruen refers to Piorry's accustomed remark, "that he

felt the modifications of percussion resonance." It is true, and cannot be too strongly emphasized. Many a time this *feeling* of the resonance of organs has been to us of greater value in determining their size and condition than the sounds conveyed to the ear. Another useful remark at the end of the first chapter, is that quality and pitch are *relative terms*, and each clinical case must always be considered *in itself*, and not as dependent upon other cases.

The author believes, in the chapter on auscultation, that the single-tubed is on the whole more satisfactory than the binaural stethoscope, as used so generally in New York, since its first introduction there by the late Dr. Cammann. A few years since we shared this opinion, but a wider and more frequent use of the binaural stethoscope has now convinced us of its decided superiority as an instrument for accurate physical investigation in regard to chest-sounds. The description of the application of auscultation to the determination of vocal resonance, as well as the exact correlation shown between a given quality and pitch of resonance and similar attributes of respiratory murmur, is very clear. This lucidity is equally commendable in the account of vocal fremitus. In inspection, as is properly remarked, an ideal standard should not be the guide of our interpretation of what we notice, but rather the differences of form or movement as we observe them upon the two sides of the same individual, compared accurately and carefully with each other.

Chapter III., which is devoted to "Principles of Classification," and to "Croupous and Catarrhal Pneumonias," is, after careful reading, unsatisfactory. It offers a vein of originality, it is true, but this is no improvement upon familiar text-books, because it is somewhat obscure and incomplete.

Under the head of "Subacute Chronic Consolidation," the author speaks of the manifestations of syphilis in the lungs, and the uselessness of physical examination to reveal them. This affirmation is strangely in discord with the statements of Fournier.

It is not, however, anything like so difficult to comprehend as the *use of the word phthisis* (p. 58), which is applied to conditions of pulmonary substance brought about by causes such as hypostatic condensation, infarction, and atelectasis. A little further on (p. 61), in speaking of *advancing consolidation*, the author makes the following correct statement: "That in proportion to the amount of consolidation the percussion will be dull, very dull, almost flat, and the pitch will be high; or the dull note will be replaced over more or less extensive areas by a tympanitic or sub-tympanitic note." We cite the two affirmations which precede, and are found in this work not far removed from each other, to justify what might otherwise appear to be a sweeping criticism, viz., that alongside of teaching that is surely not adapted to the student of "essentials" in medicine, we find very sound and healthy doctrine. This atmosphere pervades this work. We understand and appreciate as *good* much that is written; other passages are badly expressed, or contain opinions which we are unable to find recorded elsewhere. They may be true; but, if true, are not yet proven or recognized. As such they ought not to be given in a "pocket-book of physical diagnosis." On page 67 we would cite as an example of personal views the following: "The bronchial and fibroid forms of phthisis are *always* associated with more or less muscular emphysema." It would have been far nearer the truth to write that the fibroid forms of phthisis are quite frequently accompanied by disseminated patches of vesicular

emphysema; the bronchial rarely. On page 73 we cite textually, "Even in practising inspection the value of the blending of clinical observation is recognized. We can by its aid differentiate cancerous tumours, hemorrhagic infarction, aneurisms, acute pneumonias, or paralysis of respiratory movement traceable to some lesion of the central nervous system, from the physical signs of phthisis by inspection." What an olla podrida, and how difficult to appreciate why such different subjects are thus juxtaposed!

In speaking of adventitious cavities in the pulmonary substance (p. 79), the author boldly affirms that "auscultation requires that the cavity shall be at least as large as a walnut." Does he mean to say that this accurate method of investigation requires the patient to be in the third stage of phthisis before it can be rendered available, or does he really consider cavities as large as walnuts only *slight* changes of tissue? The chapter on emphysema is one of the best in the book, and we commend it for its method and general accuracy. According to the author, "it is possible, but extremely unlikely, to hear a metallic note imparted to a large mucous râle developed in the bronchial tubes." We share this opinion with him. The attributes of intra-pulmonary and pleural râles are particularly well defined, and the distinctive differences clearly brought out; and it is reiterated (p. 107) that pulmonary râles may be heard in inspiration and expiration—a fact which many auscultators are prone to forget. Attention is also specially directed to the separation of bronchitis and catarrhal pneumonia in cases in which fine mucous râles are present; here the thermometer has much utility, as the temperature ranges higher in the former disease. In the diagnosis of acute miliary tuberculosis the author omits to refer to the very marked irregularity of the temperature curve, as well as to the great matutinal elevations. He likewise fails to point out how intense is the dyspnoea, and how little this symptom is accounted for at times by the frequency of pulse and respiration, or by the evident physical changes in the lungs. In acute pleurisy it is noticed very properly that one pleural sac may be completely filled, if it occur gradually, *without* occasioning noticeable dyspnoea. No clinical fact is of greater importance at times, and the recognition of it has more than once permitted us to perform thoracentesis, and thus to save lives in most imminent peril. In the bronchial breathing of pleurisy with effusion (p. 135) "the most useful distinguishing feature is the element of distance, or muffled quality of the murmur." Amongst the physical signs of this disease, however, the greatest confidence should be placed in absolute flatness of the percussion note over the level of the fluid. Chapter X., on the lesions of the pleural cavities, is specially good; indeed, if the whole book were similar to this chapter in merit, we should have few criticisms to make. In the differential diagnosis of pneumothorax with a distended stomach, a somewhat frequent source of error, the author lays stress on the fact "if some water be sipped, the tinkle following its entrance into the stomach is very audible." Reference is duly made under the head of malignant disease of the mediastinum to the interesting researches of Gueneau de Mussy in regard to the enlargement of the bronchial ganglia in syphilis and struma, and to the confusion which may be occasioned by this condition.

A short chapter (XIV.) is given on respiratory percussion, mostly taken verbatim from Da Costa's learned article in the *Am. Journ. Med. Sci.* for July, 1875. We are arrested by the statement made in the words of the latter distinguished author, "When in a case of phthisis we find that the

dulness on percussion is no longer modified by fixed inspiration, we have a certain test of the malady having progressed."

Part II., which is much shorter than Part I., deals with the diseases of the heart and pericardium. The first four chapters of this Part, on the processes which develop cardiac affections, and on the symptoms and diagnosis of valvular diseases, are not specially valuable additions to the book. They present no incorrect statements, but they leave the mind somewhat uncertain as to the united signs which shall enable one to make an exact differential diagnosis. In other words, they lack that particular shade of dogmatism, or rather aphoristic statement, which should be a marked feature, in our opinion, of a hand-book for teaching the principles of any science or art. We might continue the analysis of this work chapter by chapter; space forbids. Moreover, the value of it would scarcely justify such lengthy criticism. We took hold of it, pleased with its appearance, and determined to read it through very carefully, as the latest addition to this department of medical literature. It differs from what we have hitherto read in plan and execution. It is no plagiarism, or even a compilation. It usually speaks well for its author, but in some places it is marred by obscure and ill-advised statements. Intermingled with these there is fortunately much that is good, well expressed, and reliable. But the faults are not small ones, and we, therefore, much as we regret to write it, hesitate to recommend it to students. Advanced practitioners may study its contents, and cull from it a great deal that is useful to know and apply, but they should be on their guard not to accept its doctrines, on all points, with absolute faith. If they are not, they would, in our opinion, form more than one erroneous judgment in physical diagnosis. B. R.

ART. XXVI.—*The International Encyclopædia of Surgery, a Systematic Treatise on the Theory and Practice of Surgery, by Authors of various Nations.* Edited by JOHN ASHHURST, Jr., M.D., Professor of Clinical Surgery in the University of Pennsylvania. Illustrated with chromolithographs and wood-cuts. In six volumes. Vol. I. New York: William Wood & Co., 1881.

IN the rapid development which our country has enjoyed in various departments of science and art during the lifetime of the present generation, it is no small satisfaction to be able to claim for American surgery its full share of credit. The natural mechanical tastes of our countrymen, and the practical bent of their character, have enabled this branch of medicine to overcome many defects of early education, and under the improved methods of study and teaching our surgical literature is beginning to take that place in the estimation of the world which is its due. The great activity and enterprise, and the vast numbers of the men of which our profession is composed, have given an enormous impulse to medical literature, now beginning to show fruit of which we have justly a right to be proud. One is led to reflections in this vein in perusing the opening volume of a great international work on surgery, brought out under the patronage and largely with the co-operation of American surgeons.

The question which naturally first presents itself relates to the necessity

of the international element in a work of this kind. Why would it not have been better to follow the customs of England, France, or of Germany, in producing a purely national book? Perhaps it may have occurred to the projectors that American surgeons were not yet quite equal to such a task; but we are more inclined to think that the true spirit of American enterprise impelled them to strike out from the beaten path, and adopt a plan wholly new. The idea of incorporating in a single comprehensive work, which should be made available by translation to several nations, the views of the most prominent men of each country, is certainly original. It has the great advantage of collecting the newest and best work from the various parts of the world, and putting it into an available form for general distribution. Whether the present work succeeds fully in realizing this expectation or not, it will be an experiment of the greatest interest and value to the medical profession, and prove one productive of most beneficial results.

The medical public has already been informed as to the detailed plan of the Encyclopædia, as it is called, through the circulars which have been distributed by the publishers. Beginning with the history of surgery and what is called general surgery, the editor, with a few exceptions, places next in order the diseases and injuries of certain tissues, and concludes with regional surgery. The term "general surgery" seems to us hardly satisfactory, but it has this advantage, that it enables the editor to place under this head as little or as much as he pleases. On the other hand, the somewhat capricious intermingling of such constitutional affections as syphilis, scurvy, hydrophobia, with articles on operative surgery, wounds, and amputations, leaves a sense of confusion in the mind as to the bearing which these subjects have upon one another, and their appropriate place in a scientifically arranged pathology.

We notice a few unimportant departures from the proposed scheme in the volume now before us, if we except what was to have been the opening article: we should have been glad to see the "Nestor of American surgery" in his appropriate place on this occasion. The international character of the work is not fully sustained in the present volume, there being but four foreign authors out of seventeen. We find in the prospectus many well-known names, such as Verneuil, Bryant, Stricker, Bellamy, Watson, Adams, McCleod, Allingham, Duplay, and Volkmann. England appears certainly to be well represented, but we should have been glad to see a larger representation from France, and we regret that the editor has not availed himself more freely of the large number of pathologists which Germany could have furnished, and whose services such a work as this could hardly afford to do without.

The book opens with an article on disturbances of nutrition and the pathology of inflammation, by Dr. S. Stricker, the well-known author of the text-book on histology, and Professor of Experimental and General Pathology in the University of Vienna. Not only do his views represent a pathology well in advance of that to which the readers of this class of books have been accustomed, but we get here from the fountain-head a great deal of original work from one of the most eminent pathologists of the day. The anatomy of the capillaries, sketched at the beginning of this article, and the analogy between their contractility and the action of glands, are points which indicate the high character of the work. The study of the vaso-motor system of nerves has made great advances during the past fifteen years, and every year our knowledge of this complex

physiological problem is still further increased; and now the pathologist makes bold to say: "I would soon advance the opinion that no physiologist, no pathologist, no therapist, can follow his profession in a precise manner, without being familiar with this field of inquiry." Professor Stricker certainly does his best to make the subject clear to his readers. We shall resist the temptation to summarize his able exposition. Space would hardly permit more than calling attention to the prominence which he gives to that group of the vaso-motor nerves which do not restrict but actively cause the vessels to dilate; to the function of the bloodvessels of the abdominal viscera as the principal regulators of the blood pressure ("an animal with complete paralysis of the vaso-motor nerves of the abdominal viscera therefore bleeds to death, as it were, into its own abdominal vessels"); to his own experiments demonstrating the existence of the dilator nerves in the posterior sensory roots which enter the sciatic; or to his arguments, by which he shows that the hyperæmia of inflammation is caused by direct local irritation of the dilators, and not by a paralysis of the constrictors, thus giving by far a more simple explanation of certain of the cardinal symptoms of inflammation than has hitherto been offered. The traditional mode of characterizing the process by these symptoms is discarded by the author, who contents himself with giving two main characteristics, namely: an active hyperæmia and an active tissue metamorphosis. We may not always have swelling or pain, and it is doubtful whether there is an actual production of heat, the elevation of temperature being due to the accelerated blood current.

To understand fully the attitude of Stricker towards the question of inflammatory changes in the tissues it is necessary to have been familiar with the standpoint of cell pathology as it existed at the time of Cohnheim's exposition of his theory of the migration of the white corpuscles of the blood. The work of many eminent young pathologists of that day was steadily leading in this direction. Recklinghausen had observed in Würzburg the amœboid movements of certain cells during the inflammatory process, while Stricker at Vienna, although he had noticed the occasional passage of red corpuscles through the walls of vessels, was seeking in the changes observed in connective-tissue cells for an explanation of the origin of the small round cells of the inflamed tissue. Cohnheim sought to overthrow Virchow's theory of cell proliferation, but Stricker, although he now confesses his views were at that time in a very rudimentary state, still stoutly resisted the new doctrine, and has continued to do so since, each new observation having served to complete and elaborate what he now characterizes as the doctrine of tissue metamorphosis. It is not a matter of surprise that there should be a tinge of strong partisan colouring in an article prepared by the chief of one of the contending factions. But making all due allowances, we must nevertheless confess that Professor Stricker seems to have exceeded his privileges in taking advantage of this opportunity to prepare what might be considered a treatise on general histology and the structure of cells, rather than an exposition of the various pathological problems of inflammation. The views of Cohnheim, which have been so prominent a feature of pathological writings during the past fifteen years, are thus disposed of, doubtless to the surprise of many readers: "The migration theory has proved to be fruitless. It has made no progress since 1867, and in regard to the doctrine of inflammation it cannot make any progress; for it denies the active processes. But the doctrine of tissue metamorphosis has made constant advances, and every new step which I have

taken in the course of the last decade has proved to be an argument against the migration theory." It would seem at least appropriate that some account of this process should be given, and that an explanation of Cohnheim's erroneous views, if such they be, should be attempted. The battleground on which this question has been mainly fought out is the cornea, the transparent structure of which has made it peculiarly favourable for histological study. Considerable space is given by Stricker to the study of this tissue and its behaviour in inflammation. Without undertaking to rehearse the various explanations which have been given of the striking pictures obtained by different reagents, we may briefly say that our author has come to the conclusion, as the result of prolonged observation, that the stellate cells, known as corneal corpuscles, are not to be regarded as permanently distinct structures, but that the adjacent basis substance in which they lie cannot always be separated from them. "One and the same strip of territory is at one period a portion of the body of a cell, or of a process; at another period a part of the basis substance." The basis substance is, like the cell, living matter, and, under the stimulus of inflammation, it, like them, may be converted into amœboid cells, or, as he would prefer to say, into *amœboid substance*. "It is accordingly the tissue itself which is transformed into pus corpuscles." In his view the branched cells of the cornea can no longer be regarded as fixed cells; indeed, he is not prepared to say that in the normal tissue in the fresh state they exist at all! What is true of the cornea he undertakes to prove at length by analogy to be true also of all other connective substances, bone, cartilage, etc. The fibrillar changes which take place in the various tissues also occupy a large portion of the article. A few general closing remarks dispose of the epithelium and endothelium, the process of healing and repair.

The other aspects of inflammation, including also some of the ground occupied by Stricker, are treated in an article entitled "Inflammation," by Dr. William H. Van Buren. We confess to a little surprise at seeing the name of this able teacher in a field so widely different from those with which we are accustomed to associate it. It would have seemed, perhaps, more appropriate to entrust such a department to the hands of some coming Paget or Sanderson. We must acknowledge, however, that there are very few writers besides the author in question who could have prepared an article requiring such a diversity of knowledge and experience of so high a grade. That portion which is devoted to the causes of inflammation is, perhaps, the best in the chapter, and possesses a special value in giving a most complete summary of the work which has been performed by Pasteur, Koch, and others in the study of the relations of organisms to disease. The studies of Koch, translated by the Sydenham Society, and the work of the International Congress have begun to shed light on this obscure domain of pathology. The work has been taken from the hands of the pseudo-pathologists and romancers, and has been put upon a basis which deserves the careful attention of every intelligent physician. It now appears that there is not only an organism which is peculiar to anthrax and another to chicken cholera, but one also which produces septicæmia in mice and one which produces gangrene in the same animal. In rabbits similar diseases are caused by the presence of certain well established forms of microbia. The connection of spirilla with relapsing fever in man is generally received. It is true that the facts already obtained are few in number, isolated from one another, and of

extremely limited application, but they are nevertheless of the greatest interest as showing that science has finally got within its grip an extremely rebellious subject, and that we have a right to hope for a revolution in our ideas of the etiology of a most important class of diseases, which may be productive of incalculable benefit to human beings. It will be a part of the curious history of our times that when the scientific world was on the eve of such important discoveries, its leaders were obstructed in every possible way in their work by the zeal of indiscreet reformers.

The anatomical part of the subject is perhaps the least interesting in the article, and we turn with pleasure to the final sections on treatment, where our author writes as one having authority. There is to be found a calm, judicial review of modern methods and ancient as well, many of the latter receiving finally an official death-blow. The following sentence is an illustration: "Meanwhile antiseptics are gradually taking the place of antiphlogistics; the latter cease to be thought of in proportion as the former grow in the confidence of the profession; and the opinion is, on the whole, steadily gaining ground, that antiseptics constitute the best preventive measures against unhealthy inflammation." Again, "It is a common practice to cover an inflamed surface with mercurial ointment before applying a poultice. This is based on the wide-spread belief, founded upon its singular efficiency in syphilitic inflammations, that the drug has a certain power in mitigating the intensity of the inflammatory act, and in rendering exudations more readily absorbable. There is no positive evidence that mercury possesses this power except in syphilis." In regard to the anti-inflammatory virtues of aconite, digitalis, veratrum viride, and perhaps we need hardly add tartar emetic, Dr. Van Buren is equally sceptical.

One turns with considerable interest to the article on septic fevers. This is written by Dr. Delafield, of New York, and is entitled *Pyæmia and Allied Conditions*. Although it consists of but nine pages, it is adorned with no less than two large coloured lithographic plates, which, as they show pathological appearances (metastatic abscesses) familiar to most students, are, we presume, intended to do a sort of chromo work for the whole volume. Dr. Delafield is evidently at home, both in the literature and the pathology of the subject; and what he has to say will be of special interest to every student in this department of pathology; but the confusion which still remains in the minds of English readers in regard to the classification of the different varieties of surgical fevers, and their relations to the healing of wounds, renders it particularly desirable that an attempt should be made to give to each a more defined position. The general impression left by this article is that, clinically as well as pathologically, there is but one disease of protean aspect and of uncertain origin. This is hardly a fair statement of the case, and is a position which tends to throw the question back into the chaos from which modern science had, to a certain extent, succeeded in rescuing it. It is true that the names *septicæmia* and *pyæmia* now no longer express what was originally meant by them, but this is no ground for placing the entire group under the latter heading. There is no attempt to bring out the fact that a form of malignant fever may be developed when no suppuration exists, and that during that process we have an equally malignant variety accompanied by clinical symptoms and pathological changes, which present sufficiently destructive peculiarities to authorize its recognition as a separate disease. Undoubtedly we

find cases in which the two forms seem to blend, or in which the symptoms are not sufficiently characteristic to enable us always to make a positive diagnosis during life, yet more than one of the cases cited to emphasize this uncertainty could, we think, have a different interpretation from that for which they are designed.

For the practical surgeon it is important to recognize the special conditions under which these forms are likely to develop; this is not clearly set forth, and there is much that is confusing in his method of treating this part of the subject. It is not definitely stated, for instance, what symptoms almost invariably accompany that form in which we find metastatic abscesses, or under what circumstances or stage of the healing process these are likely to occur. The statement of the treatment of these fevers is equally unhappy, and betrays a lack of clinical experience. The view that "treatment is of no avail" would hardly be received by the majority of surgeons, and we feel sure that Mr. Lister would object strongly to the statement that he had "devised a system of dressing based on the use of carbolic acid." We are encouraged to indulge in a critical vein; as we find that the editor has felt called upon to add to and comment upon some of the author's work.

Not among the least interesting features of this volume is an article by Verneuil on the reciprocal effects of constitutional conditions and injuries. The nature of the soil in which the surgeon works is often overlooked in estimating the advantages of a special method, or a favourite operation. The tendency of the surgical mind is to become impatient of the somewhat plodding ways of his medical colleague, of preliminary examinations for supposed disease, none of the external manifestations of which may show themselves, and when we read of the baneful effects of arthritism, scrofula, hepatism, nephriism, cardism, syphilis, and the long list of affections cited by the author upon wounds and operations, we shudder to think of the livers, the kidneys, and lymphatic systems which have quietly succumbed beneath the knife of many a "fine operator." It has been said, and perhaps well said, that to kill a man is a hard thing to do, and one is often surprised to see how many a frail creature or physical "dead beat" will survive the most appalling surgical experiences. On the other hand, we have perhaps yet to learn whether a more careful consideration of constitutional conditions may not prove a more important factor in surgical statistics than improvements in methods of operating or treating wounds. The principal affections which our author discusses are arthritism, cancer, scrofula, tuberculosis, scurvy, syphilis, malaria, alcoholism, diseases of special organs, pregnancy, and old age. The relations of these diseases to surgery appear to have been an object of special study by him, and although he has felt himself called upon to present only the dark side of the subject, we commend his teachings to the thoughtful perusal of the practical surgeon.

Dr. Alfred Stillé's article on Erysipelas is perhaps the most scholarly in the book, and from a literary point of view is an excellent model of the style suited to such a work. The author very properly does not commit himself definitely as to the causes of erysipelas. He is, however, an earnest believer in a specific contagium, which may enter the system either by a lesion of the integument, or through the mucous membranes, although he would assign to certain external conditions an influence in the production of the disease. The effects of heat and cold, of damp weather, draughts of air, and the east wind cannot be wholly ignored by any sur-

geon of experience. On the other hand, the experiments of Koch, as we have already seen, have given some definite results, which, although extremely limited, must, we think, be given an important place in the study of the etiology of erysipelas. Our experience of this disease inclines us to the opinion of those who believe feebly in idiopathic forms of the disease, and we are inclined to seek some abrasion or lesion as the point of entrance of the poison.

The article on hydrophobia, by Dr. W. S. Forbes, is not so satisfactory as we have a right to expect after the experience gained during the past few years. The physiological pathology is a point which was ably exposed in a very valuable article by the late Dr. T. B. Curtis, which the author appears to have overlooked.

Mr. Butlin, of St. Bartholomew's Hospital, contributes a surgical study of scrofula and tubercle. His pathology is modern, and his experience sufficiently extensive to make a very interesting article. We are somewhat surprised that the article on Rachitis has not been given to a London surgeon, in view of the great prevalence of the disease in that city, but we are not disposed to complain of a subject confided to the care of so able a writer as Dr. J. Lewis Smith.

The article on Scurvy has been appropriately written by Dr. Philip S. Wales, the Surgeon-General of the U. S. Navy, and we should class it with Dr. Stillé's article in point of literary quality. Dr. Agnew is not, perhaps, at his best on such a subject as the General Principles of Surgical Diagnosis. This, and the article on Operative Surgery in General, by Dr. J. H. Brinton, seem to us attempts to cover ground which hardly comes within the scope of such a work as this. Most of what is written belongs to the clinic or lecture room, or may be easily interpolated in other articles, and in fact a good deal of what is said can be found elsewhere. We can, however, be sure that the authors have made the most of their subjects. Dr. Henry M. Lyman's "Anæsthetics and Anæsthesia" is a very valuable contribution to that subject. The historical portion leaves little to be desired in the clearness and fairness of the statement. The phenomena, the physiology, and the accidents of anæsthesia all receive careful attention, and the chapter closes with a very imposing description of the properties of anæsthetic substances. An article on Minor Surgery, by Dr. Charles T. Hunter, and an article on Plastic Surgery, by Dr. Christopher Johnson, Emeritus Professor of Surgery in the University of Maryland, both of which are very practical and amply illustrated, also appear.

The volume closes with an exceedingly interesting and valuable article on amputation, by the editor, Dr. Ashhurst. The history of amputation displays to advantage the author's erudition, and is illustrated with woodcuts, showing many curious methods and appliances. It is preceded by a brief defence of the operation so often designated as the *opprobrium* of the art, in which he espouses a phrase of older writers, who dubbed it "*the humane operation*." Under the leading conditions calling for amputation, we notice as of special interest cases of laceration caused by wild animals, several of which are reported. The rule given that no amputation should be undertaken until after the complete establishment of the line of separation hardly coincides with the views of a distinguished surgical authority of Philadelphia, who lays down the rule, if we remember rightly, that in idiopathic gangrene one should wait for the line of demarcation to form; but in traumatic gangrene one should operate immediately. Yet, in some cases, as in the "traumatic or spreading gangrene," our author does recom-

mend amputation at a point sufficiently removed from the disease. We think a better rule would formulate itself somewhat thus : if the gangrene remains a local affection, the surgeon should await the formation of a line of demarcation ; but if it shows a tendency to spread rapidly, amputation at a sound point should be resorted to, or free incisions should be made in the dead tissue to give the poisonous fluids and gases an opportunity to escape. For it is to the latter agents that the transmission of the mortification from injury to adjacent sound parts is chiefly due. We notice that pyæmia is not mentioned as a condition calling in certain cases for amputation, although wounds from poisonous bites have a place upon the list ; in many continental cities the operation is performed for the purpose of removing the source of pyæmic poisoning, and is held in estimation by many surgeons. The instruments given are well chosen, although we should hardly feel satisfied with the cross-spring catch or slide-forceps delineated. The long, narrow, straight armed toothed forceps, without catch or combination of any kind, have always seemed to us a much more "surgical" instrument. Dr. Ashhurst is evidently a conservative in his methods of treating wounds, and also very methodical, for we find that he always uses twisted metallic sutures, and is in the habit at the first renewal of a dressing after an amputation of trying every suture in succession, and untwisting it a little if it seems to be applied too closely. We would not have it supposed that we intend to decry the amount of time and personal attention of the surgeon which this implies. It is, doubtless, habits like these which enable him to obtain such excellent results without resort to "antiseptic dressings," and to maintain the primitive simplicity of that school of which the good Samaritan was a disciple. Although Dr. Ashhurst does not count himself among the followers of Lister, we think an acknowledgment is due, in such an article as this, to the work which this great surgeon has accomplished. That the so-called antiseptic dressing is not a panacea for all the ills which wounds are heir to would hardly be maintained by its most ardent supporter, and we think its author even would allow that it is not the only method by which they may be averted. But we venture the surmise that were our good friend of the Scriptures to fall among the *personnel* of the average hospital staff, he would eagerly avail himself of a few of the modern safeguards against human carelessness. The remarks on the mortality of this operation are extremely interesting, and contain a number of valuable tables, counting amongst them a list of 100 consecutive cases occurring in the author's practice. Among the latter are three amputations at the hip. The number of deaths in Dr. Ashhurst's cases was but 28. Analyses of statistics are given to show the influences of age, sex, the period of the operation, and so forth upon the results. They are features of interest, not only on account of the useful information which they convey, but also as specimens of intelligent and thorough work. There are also tabulated by Dr. F. C. Sheppard 633 cases of hip-joint amputation. Of special amputations, those about the ankle and knee present the greatest interest, for it is in these regions that surgical ingenuity has had the most favourable opportunity to develop itself. The various methods employed at the knee-joint are conscientiously enumerated, leaving, perhaps, too much doubt in the mind of the reader which of them has best stood the test of experience. On the other hand, we do not find mentioned one of the most important of the amputations at the ankle-joint, that described by Soupart, and to our minds giving decidedly the best stump. Tripièr's modification of Chopart's method is

barely mentioned, and the principle by which the disadvantages of the latter operation are overcome is not alluded to. It has been generally supposed that the malposition of the stump, producing a tendency to ulceration, was caused by the action of the muscle pulling on the tendo Achillis. It is now recognized to be due to the obliquity of the os calcis, the lower surface of which is made horizontal by a cut through the bone.

We are disappointed in the illustrations accompanying this volume: although we are spared the time-honoured transmittenda which publishers are wont to cling to with an almost paternal affection, those which take their place have a certain pre-Raphaelite flavour which does not reflect credit upon the progress made in this department of art. Considering the vast amount of money annually spent by the profession in this country in medical literature, for we believe there is no better market in the world, we think it has the right to demand the highest grade of excellence in all departments of the publisher's art. We are disposed also to criticize gently the size of the volume, which renders the perusal of an article in one's easy chair, with the evening cigar, a task requiring the exertion of no small amount of muscular force. The large and handsome type, however, makes reading easy to old eyes, and the volume presents the elegant and dignified appearance which a work of such great importance to surgery should possess.

J. C. W.

ART. XXVII.—*A Treatise on Diseases of the Eye.* By H. D. NOYES, A.M., M.D., Professor of Ophthalmology and Otology in Bellevue Hospital Medical College; Surgeon to the New York Eye and Ear Infirmary; President of the American Ophthalmological Society, etc. 8vo. pp. 360. New York: Wm. Wood & Co., 1881.

THIS work, which is one of the Wood series, is something more than a hand-book. Though it is condensed into a comparatively small compass, its author not only gives us the results of his own extensive experience, but has carefully searched the modern records of the literature of his subject, and presents an excellent epitome of the ophthalmic surgery of to-day. Brief statements are given of the anatomical structure of the different parts of the organ, and the discussion of important points in physiology and pathology is sufficiently full for all practical ends. The subjects of paralysis of the external muscles of the eye and of the various forms of optic neuritis and atrophy, so interesting and important in their connection with general medicine, are ably and quite freely discussed.

Though the author has, of course, some views of his own, there are none that can be called "whims;" the directions for treatment are practical and sound, and represent fairly the practice of ophthalmic surgeons in America. There are very few exceptions to this rule; we think, for example, that the majority of ophthalmic surgeons commence with a weaker glass than $\frac{1}{8}$ or $\frac{1}{6}$ in presbyopia, and that $\frac{1}{2}$ or $\frac{1}{6}$ is more frequently the first prescription. A $\frac{1}{6}$ can rarely be continuously used with entire comfort in the commencement of simple presbyopia; and a glass stronger than is necessary to give sharp definition at the accustomed reading distance is thought by some good authorities, not only to render the wearer unnecessarily dependent on its aid, but to actually hasten the loss

of the remaining accommodative power. Iodide of potash is entirely omitted from the list of remedies in parenchymatous keratitis, perhaps inadvertently, as it is very generally used in this disease, which, in a large proportion of cases, is a form of tertiary syphilis, and is more influenced by the iodide than by any other medicine. Inunction, which is the only form in which the use of mercury is recommended, would be found worse than monotonous in the long, weary months of treatment that this disease demands.

Not much is to be said of paper and print, except that they are in accordance with the price of the book, the subject-matter of which deserves to be presented in a more elegant form, and to command a higher price. Though the cuts generally answer the purpose of illustration fairly well, they are far from being good specimens of high art; the coloured plates of the fundus are probably much the worst that have ever appeared in public, and none of the four portraits of the author do him justice. In spite of these drawbacks, Dr. Noyes is to be congratulated upon having produced a really good book, which will take rank at once among the best text-books on the subject in our language. The general practitioner can depend upon it for all that his practical needs require, and the specialist will often find it a convenient reference.

It is to be regretted that many who will want the book cannot obtain it without paying for eleven other books that they do not want.

G. C. H.

ART. XXVIII.—*On the Rapid Method of Cure of External Aneurism by means of the Elastic Bandage. With a table of Seventy-two Cases.* By A. PEARCE GOULD, M.S., F.R.C.S., Lecturer on Anatomy at the Westminster Hospital Medical School, Assistant Surgeon to Westminster Hospital, Surgeon to the Northwest London Hospital. 8vo. pp. 52. London: J. W. Kolckmann, 1882.

THE dangers attendant upon diseases of the arteries have always been recognized by the medical profession. Much attention has been devoted to the subject, and the methods of treatment to be adopted in cases of aneurismal dilatation of the vessels have been many and varied. When the application of a ligature in the continuity of the vessel was suggested and practised, it marked one of the most decided steps taken in advance in the whole domain of surgery. Great as have been the successes attendant upon that operation, many as have been the lives saved by it, yet the dangers attending its performance have always been considerable, and have led to many attempts to substitute some other method of procedure.

When Esmarch introduced the elastic bandage to the profession as a means of controlling hemorrhage, its proven efficiency very naturally led to its being thought of as a suitable agency for the treatment of those external aneurisms to which it could be applied. The anticipations formed of its efficiency have not as yet been fully realized, and to examine into the cases recorded, to study the causes of failure in some, while others were brilliantly successful, is the task which Mr. Gould undertook in a paper read in the Surgical Section at the International Medical Congress held in

London last summer, and which he has further extended in the present pamphlet.

The importance of the subject is a sufficient apology for speaking of Mr. Gould's work at some length. The first chapter is occupied with an account of the rapid method of cure by digital compression, introduced by Murray in 1864, and of the case in which Dr. Walter Reid first and successfully applied the elastic bandage. The details of this case are important, as showing that Dr. Reid appreciated the principles upon which the successful application of his method must depend, and from which it would appear that but little variation can be safely or judiciously made.

In a case of popliteal aneurism Dr. Reid applied an elastic bandage from the toes to the junction of the middle and lower thirds of the thigh, taking care that it was quite loose immediately over the aneurism itself. The elastic tubing was then wound round the thigh just above the bandage, and the latter removed. After fifty minutes, the pain at the seat of constriction being severe, a Carte's compressor was adjusted to the main trunk at the pelvic brim, and the tubing removed. This compressor was then kept lightly and intermittently applied till the next evening. The patient was cured of the aneurism, but died of bronchitis, etc., nine months afterwards. The rationale of this treatment is simple. The circulation in the limb was totally arrested; with the aneurism full of stagnant blood. Rapid coagulation ensued, and the application of the compressor so modified the direct arterial flow as to prevent it breaking up and washing away the freshly formed coagulum, while the establishment of the general circulation in the limb by anastomosis was not interfered with after the removal of the tubing.

The second chapter is devoted to a study of the pathology, or history of the formation of blood clot. It is well shown that, while most of the methods of treatment adopted aim at the gradual obliteration of the aneurismal sac by the deposition of layers of fibrine, in some, and in the one now under consideration, the object is to obtain the immediate formation of a blood-clot, containing corpuscles as well as fibrine, filling the whole cavity of the aneurism. This is unquestionably the end aimed at by Dr. Murray in the method of digital compression introduced by him, but it is quite certain that in very many cases where it is practised, the successful result following long-continued compression is owing to the deposit of successive layers of fibrine within the sac. So when a ligature is applied, the collateral circulation is speedily established, and a recurrent blood stream soon flows into the aneurismal sac, or at least impinges upon the fresh coagulum which has formed in it, but as it is comparatively slow and feeble, with the result that continued deposition of fibrine takes place. This at least is the favourable issue. But often the returning current is sufficiently strong to wash away the clot already formed. In this lies the explanation of many failures of digital compression. A feeble stream is allowed to flow into the sac gradually disintegrating the clot first formed. Whether the compression exerted completely arrests the circulation, or does so gradually and partially, in either case no attempt is made to control the collateral circulation.

In Reid's method the plan is totally different. The first effect of the elastic bandage applied to the foot is to completely empty the capillaries, as well as the larger vessels, and to form a dam beyond which the circulation from above cannot pass. The effect of this is to distend the sac and the artery with stagnant blood. Then the bandage passing lightly over

the tumour, so as not to express its contents, is again applied firmly above, and if necessary supplemented by the use of the tube, to the complete stoppage of the circulation in the whole limb. It is left in this condition for about one hour, by the end of which time the blood within the aneurism has, in all probability, coagulated *en masse*. Then compression being applied to the artery above the tumour, and the direct circulation being more or less perfectly controlled, the bandage is removed, and the anastomotic circulation allowed to establish itself. The continued compression upon the main trunk meantime diminishes the current, or entirely prevents the blood passing into the aneurism with force sufficient to wash away, or break up the clot. In favourable cases that part of the clot contained in the artery undergoes organization, while that in the sac is partly absorbed, and partly remains as disintegrated material.

It will be seen that in Reid's method the important point is to obtain complete stasis of the blood, and various modifications have been made with the object of securing this advantage without some of the disadvantages attached to the proceeding. Thus where the sac has been thin, and the surgeon feared its too great distension if the elastic covered the whole extremity, the bandage has been applied merely just below the aneurism, while compression was made upon the main trunk to prevent the systolic impulse disturbing the integrity of the clot.

Mr. Gould does not think that we can decide why coagulation takes place, but that it always does so in a distended aneurism is proven by experience, and the results shown in his table of cases.

As has been before said, the destiny of the clot in the trunk of the artery, and of that remaining in the aneurismal sac, is very different. In the latter it undergoes more or less perfect absorption, and the sac contracts upon it, but in the former it becomes organized, and secures permanent closure of the vessel.

Mr. Gould says, "The permanent cure of the aneurism is brought about by organization of the thrombus in the artery rather than by any change in the aneurism itself, the clot in the aneurism being of use mainly as a means of securing a thrombus in the artery," and "the process of cure by this treatment depends, then, first, upon clotting of the blood, which commences in the aneurism, and spreads into the artery; and, secondly, upon the organization of the clot in the artery."

The causes of failure in this operation are two: either the blood does not coagulate, or the coagulum in the artery does not organize. Mr. Gould proceeds to an examination of the reasons for these failures, and the result is, that, while in some cases the failure may depend upon an aplastic state of the blood, in the very great majority it originates in allowing the blood-current from above to impinge with too great force upon the newly-formed coagulum, which must undergo shrinking by the loss of serum involved, and be thereby loosened in some of its attachments.

Chapter IV. is occupied with a consideration of the objections which have been urged against this method. While Mr. Gould recognizes the fact that the application of Esmarch's bandage sometimes increases the blood tension, he thinks that it does not always do so, and is of the opinion that, while a careful examination should always be made of the arterial system beforehand, there is not sufficient force in the objection to interdict its use. The same precautionary measure of an examination of the circulation is regarded by Mr. Gould as a sufficient protection from the risk that fatal syncope may follow the removal of the bandage. The continued compression

exerted upon the main trunk for the protection of the newly-formed clot should at the same time prevent a dangerous flow of blood into the capillaries, dilated as they are from vaso-motor paralysis. But, as a matter of course, any measure is dangerous, when a feeble circulation, depending upon diseased conditions, exists. Case No. 30 in the table, that of Dr. Weir, would appear to have been a case in point. A tendency to cause gangrene has been urged as an objection against the elastic bandage. Two cases appear in the table, but Mr. Gould thinks that an examination into their details does not warrant the conclusion that the form of operation was accountable for the ill result. That ecchymoses are apt to form over the tumour has been noticed by several observers, but here, also, Mr. Gould is satisfied that protection of the skin, by moderately firm pressure, will avert the evil.

Mr. Bryant has suggested that there may be a risk of this mode of treatment setting up albuminuria, but Mr. Gould, after examining the reasons given for this fear, thinks that it will be found to be groundless, and that the observed facts do not warrant it, inasmuch as the increased blood tension is of very short duration. Mr. Gould does not think, either, that there need be any fear of using ether in these cases, preferring it to morphia, which is less effectual in controlling the severe pain attendant upon the procedure. Mr. Gould's table shows no case in which injury of the nerves was produced by the bandage, while, in but one case, has its use resulted in rupture of the aneurismal sac. The objection that the proportion of failures has been large where this method has been resorted to, is well shown to lie with equal force against other methods of compression, and Mr. Gould thinks that many of the failures can be distinctly traced to a want of appreciation of the rationale involved, and a neglect in carrying out some of the details.

It will be evident to any one reading this chapter that Mr. Gould occupies the position of a special pleader rather than of an impartial judge, yet we would not be understood as implying that he has not fairly met the objections urged against the use of the elastic bandage. But, as he is an earnest advocate for the method, he has very naturally shown a disposition to look leniently upon the grave charges brought against it.

In Chapter V. Mr. Gould subjects the seventy-two cases he has tabulated to a careful analysis upon the following points: 1. Age of patients. 2. Constitutional disease. 3. Character of aneurism. 4. Seat of aneurism. 5. Effect of preliminary treatment. 6. The frequency, duration, and exact mode of application of the elastic compression. 7. The duration and kind of subsequent treatment. 8. The subsequent history of the cases in which this treatment failed. 9. The influence of anæsthetics.

Through the details of this analysis, thorough and valuable as it is, we cannot follow Mr. Gould. It will be sufficient to give briefly some of the conclusions at which his study of the subject has enabled him to arrive.

First, the method introduced by Dr. Reid is worthy of further and more extended trial. It has had a large measure of success, is easily applied, and its success or failure, in a given case, is so speedily and easily recognized, that it is well suited for properly selected cases. Its dangers and disadvantages have been much exaggerated, and a judicious selection of cases, with a careful attention to the details of the treatment, will, in great measure, obviate them. Second, in selecting cases to be subjected to this method of treatment, it is of great importance that the vascular system should be otherwise healthy. When practicable, preliminary treatment,

with the object of increasing the coagulability of the blood, should be instituted; to this end a dry albuminous diet, and large doses of iodide of potassium seem to be most conducive. While complete stasis of blood in the aneurism and adjacent artery is essential, it is of much importance that the bandage shall be so applied as to disturb the general circulation as little as possible. On this account, Mr. Gould advises that the blood should not be expressed from the whole limb, as originally proposed by Dr. Reid, but only from that part of it immediately below the aneurism. The stasis thus obtained should be maintained for an hour and a half. Afterwards, and whether a clot has formed or not, the bandage should be removed, and the main artery compressed for from six to twelve hours, either by the finger or by a tourniquet. When the aneurism is large, and growing rapidly, the bandage should be carried lightly over the tumour. Should failure ensue, the prospect of success following other methods of treatment is not impaired by the trial.

On every page of this pamphlet there is manifest evidence of the painstaking care Mr. Gould has bestowed upon his study of the subject. He is entitled to much praise for the thoroughness with which he has done his work, for it is by such labour that a true estimate of any new surgical procedure can alone be arrived at. In this instance Mr. Gould has done much to place the operation, for which, as we have before said, he is an earnest advocate, upon a firm basis. The number of cases submitted to his study is tolerably large. When that number is increased, as it will be, we shall know whether Mr. Gould's fairly deduced conclusions are sustained.

S. A.

ART. XXIX.—*Manual of Diseases of the Skin, with an Analysis of Eight Thousand Consecutive Cases and a Formulary.* By L. DUNCAN BULKLEY, A.M., M.D., etc. Duod. pp. 312. New York: G. P. Putnam's Sons, 1882.

IN this little book the attempt has been made to present the subject of diseases of the skin concisely, and yet with sufficient detail to be of practical value to the student and practitioner. Pathology is introduced but briefly, and no attempt has been made to enter the literature of the subject, or to present or discuss doubtful questions. Differential diagnosis has not been fully entered upon for want of space, and here we think the author has made a mistake, for this is so important a matter, that it will not do to pass it over by merely mentioning in connection with each eruption those with which it may be confounded. Diagnosis is so clearly the groundwork of the most elementary knowledge of diseases of the skin, that we think Dr. Bulkley would have done better to omit some things which he has put into his little manual (*e. g.*, the chapter giving an analysis of eight thousand cases) in order to give a little more fulness to the sections on diagnosis.

After giving short chapters on the study of dermatology, the anatomy and physiology of the skin, nomenclature and classification, relative frequency of diseases of the skin, diagnosis and etiology, Dr. Bulkley goes on to describe the various distinct affections in detail, and concludes with

chapters on diet and hygiene of diseases of the skin, and therapeutics of diseases of the skin.

The classification employed by Dr. Bulkley is essentially that of the American Dermatological Association, now the acknowledged standard in this country, and very like Hebra's classification, which is employed in Germany, and which is winning its way also in France and England. It is indeed a happy day which appears to be dawning in the dermatology of the present, when all the chief teachers of this branch of medicine unite in employing the same classification, and to a very considerable degree a similar nomenclature. This plan, as followed in Dr. Bulkley's book, will enable the student who has made use of it during his studies and in connection with his class instruction, to pass without confusion from it to Duhring when he desires to push his studies further. We regret, however, to observe here and there the use of obsolete and confusing terms, as "syphilitic psoriasis." It would be well if this lumber were once for all put away out of sight.

The discussion of the various affections is brief and terse, but clear, the fault, if any is to be found, lying in the too frequent introduction of synonyms and unnecessarily minute subdivisions, a course which loads the text with those quantities of new names so discouraging to the beginner. The treatment in each case is indicated in a general way in the text, and reference is made by number to the appropriate formulæ to be found at the end of the book.

On the whole, this little work is the best of its kind thus far presented to the profession, and is in all respects far superior to the manuals sent over by our English brethren, upon which we have heretofore been obliged to depend.

A. V. H.

ART. XXX.—*A Treatise on the Diseases of the Nervous System.* By JAMES ROSS, M.D., M.R.C.P. London, etc. In two volumes. Vol. I. pp. 594, and Vol. II. pp. 998. New York: William Wood & Co., 1881.

THIS is a very ambitious attempt to give an account of the anatomy, physiology, and diseases of the nervous system. There are, in the two volumes, 1600 pages nearly, 285 cuts, and 6 plates. The anatomical descriptions and the illustrative cuts are, for the most part, taken from Landois, Henle, Kölliker, Charcot, Duret, Ferrier, and other well-known sources. The illustrations are, generally, well done. Although having an American imprint, the printing was, no doubt, executed in England. It seems to us a mistake to have so great a disproportion between the two volumes in size—the second volume being nearly twice the size of the first. The necessity for such an arrangement is not apparent, since the "Special Pathology of the Nervous System" is continued from Volume I. Viewed as a whole, the work must be regarded as a treasury of information collected, as we will see, from convenient sources. Symptoms of an intellectual indigestion are manifested abundantly, and heaviness from repletion is an obvious condition of the work. The author seems to us to have laboured over his task, to have carried it along as a grievous burden, and to have been borne down almost by the mass of materials.

In the preface we find the author saying that he contemplated a full bibliography, but abandoned it, in consequence of the great dimensions to which the work had grown. He, however, gives a list of the works in which a full bibliography may be found. We regret to be compelled to add that he has made an unwarrantable use of some of the references in this list, and has displayed a wealth of bibliographical acquirement for which he is indebted to others. We find, especially, that he has not only plagiarized references, but has transcribed paragraphs and sentences without acknowledgment. Several volumes of Ziemssen's *Cyclopædia* have been made use of with a freedom which only a liberal application of quotation marks could warrant. We select some of those to indicate the mode in which a big book may be constructed with little more than mechanical dexterity.

We may begin our examination at various points, but let us first take up Poliomyelitis Anterior Acuta; see page 122, vol. ii. of Ross, and p. 671 vol. xiii. of Ziemssen (Am. ed.).

Ross, ii. pp. 122-3.

The other most notable cases which have been reported at an early period of the disease are those of Roger and Damaschino, Roth, Leyden's second case, Parrot, and Joffroy, and a case briefly reported by Rinecker, which was examined by Von Recklinghausen. No marked changes were discovered in the cord with the naked eye. In some cases the substance of the cord seemed tougher at the level of the cervical or lumbar enlargements, and the antero-lateral column on the affected side appeared atrophied and distorted. On transverse section the anterior gray horns were observed to be more or less discoloured, whitish or reddish, sometimes soft, diffuent, and diminished in volume. The anterior roots at the level of the parts mainly affected were found gray, translucent, and atrophied. . . . In the lumbar region, sometimes on one side only, but usually both sides, an area of softening has been found, in the anterior gray horn, sometimes extending the whole length of the lumbar enlargement, and sometimes only a portion of it in longitudinal extent. The area of softening was sometimes situated toward the centre, sometimes toward the anterior part of the horn, being separated from the surrounding parts by a sharp line of demarcation. . . . The substance of these areas was friable, soft, and disseminated with numerous granulation cells. . . . The nerve fibres and axis cylinders within the area of softening were also found to have entirely disappeared.

ERB, *Ziemssen*, vol. xiii. p. 671.

Observations made *at an early period of the disease* (Roger and Damaschino, Roth, Leyden's second case, Parrot, and Joffroy, probably also the case very briefly reported by Rinecker and examined by Von Recklinghausen) show that sometimes nothing abnormal about the spinal cord can be discovered by the naked eye; sometimes the substance of the cord seemed tougher at the height of the cervical or lumbar enlargements, and there was a slight dwindling of the cord, especially at the expense of the antero-lateral columns. On making a transverse section, the markings were somewhat indistinct, the anterior gray substance was more or less discoloured, whitish or reddish, sometimes soft and diffuent; sometimes a diminution in volume of the anterior gray horns can be shown. The anterior roots—corresponding to the main seat of the disease—are gray, translucent, and atrophied . . . particularly at the lumbar enlargement. Here we find, usually on both sides, though sometimes only on one side, an area of softening in the anterior gray horn of greater or less longitudinal extent . . . sometimes situated more towards the centre, sometimes more towards the front of the horn, and is separated from the surrounding parts by a more or less sharp line of demarcation. . . . Their substance is friable, soft, and disseminated with numerous granulation cells. . . . The nerve fibres and axis cylinders within the area of softening are also found to have entirely disappeared.

ROSS, *Ibid.*, p. 124.

The anterior roots are diminished in size, and show signs of degenerative atrophy when examined microscopically. Observations have been made, from seventeen to sixty-one years after the origin of the disease, by Cornil, Prevost and David, Vulpian, Lockhart Clarke, Charcot and Joffroy, Petit fils and Pierret, Leyden, Gombault, Déjerine, F. Schultze, and others.

These extracts are fair specimens of the close adherence of Ross to the work of Erb. In fact, the matter contained in the pages 111 to 126 inclusive, on the subject of poliomyelitis anterior acuta, are almost entirely taken from Erb, some changes of expression being introduced now and then. We do not find any allusion to Erb, any quotation marks, or other evidences of indebtedness. In the chapter on myelitis the appropriations are numerous and extensive. Some alterations in phraseology are occasionally made, but sentences and whole paragraphs are appropriated and exactly reproduced. If the reader will now turn to the chapter on myelitis in Ross's book, and compare it with Erb's treatment of the same subject in Ziemssen's *Cyclopædia*, vol. xiii. page 393 *et seq.*, he can verify the extracts below.

ROSS, *Ibid.*, p. 399.

As the disease progresses, the affected parts become paler and softer. . . . The change of colour from red to yellow is due partly to the diffusion and alteration of the colouring matter of the blood, and partly to the fatty degeneration of the medullary sheaths, and the formation of masses of fat granules. . . .

Owing to the continued process of fatty degeneration, the colour becomes progressively whiter, and the diseased portions assume a creamy or milky appearance. The medulla now swells up above the cut surface and assumes a pulpy or even fluid consistence, and often flows out of the sac of the pia mater. After a time nothing remains of the inflamed spot but the vascular network and a portion of the hypertrophied septa, between which a softened mass is held that can be readily pressed out.

Page 280.

The absorption of the softened masses continues until all the fluid portions have completely disappeared. Nothing remains but the vascular and connective-tissue network, which are in part thickened and hypertrophied. They

ERB, *Ibid.*, p. 673.

The anterior roots are diminished in size, atrophied, and under the microscope show the signs of degenerative atrophy. . . . We have such observations, made between seventeen and sixty-one years after the origin of the disease, by Cornil, Prevost, Vulpian, Lockhart Clarke, Charcot and Joffroy, Petit fils and Pierret, Leyden, cases 1 and 3, Gombault, Déjerine, F. Schultze, and others.

ERB, *Ibid.*, p. 394.

As the disease progresses the affected spot becomes constantly paler and more and more softened. Its colour changes gradually from red to yellow; this change is due partly to the diffusion and alteration of the colouring matter of the blood, partly to the fatty degeneration of the medullary sheaths, and the formation of masses of fat granules. . . .

In consequence of the accumulation of fatty detritus, the colour becomes progressively whiter, and the entire substance assumes a creamy or milky appearance. . . . The medulla swells up very much above the cut surface, acquires a pulpy, even a more fluid consistency, and often flows out of the sac of the pia entirely. . . . At last nothing remains of the diseased spot but the vascular network and a portion of the hypertrophied septa, between which is a softened mass that can readily be pressed out.

Page 395.

The resorption of the softened masses continues until finally all the fluid portions have completely disappeared. Nothing remains but the vascular and connective-tissue networks, which are in part thickened and hypertrophied;

form a more or less dense, shrivelled, grayish, semitransparent cicatrix which is often pigmented. . . .

More or less extensive collections of fluid may be left behind in the meshes of the cicatrix, and lead to the formation of single or multiple cysts. They usually contain a muddy fluid resembling milk, or more frequently serum.

In some cases the interstitial tissue becomes hypertrophied and consolidated. It increases in thickness and density; the vessels become larger and their walls thicker; the previously softened spot becomes firmer and denser, gray, and semitransparent, and presents a marked contrast in colour and consistency with the surrounding parts.

Page 281.

In the first stage there is marked dilatation of the capillaries and small arteries, and more especially of the small veins. They are distended with blood, and not unfrequently enveloped in layers of white and red blood-corpuscles arranged in the form of a sheath. . . .

Marked changes are found in the neuroglia. The fibres of the reticulum are thickened and swollen; the network is much denser and more distinct, and in part filled with nuclei and with cells. The glia cells themselves are swollen and increased in number, and often contain several nuclei. Granule-cells in greater or less number are found either in the immediate neighbourhood of the vessels or scattered irregularly in the interstitial tissue and its meshes.

The same careful appropriation of Erb's work extends on through this section for several pages. The reader may also compare Ross's description of the "Symptoms," beginning on page 273 (vol. ii.) and ending on 277 inclusive, with Erb's account, from page 402 to page 414; also the "Diagnosis" by Ross, p. 289, and the same by Erb, p. 419; and the "Prognosis" by Ross, p. 290, and the same by Erb, pp. 420 and 421. In these portions of the two works the same correspondence will be found; sentences, paragraphs, and current references are utilized by Ross, with trivial variations, from Erb's text.

If our readers will now also compare the chapters in the two works on *Tabes Dorsalis*, remarkable and extensive correspondences will be seen. We could transcribe pages, but it is useless to encumber our columns with so much. The comparison may readily be made by any one interested in the demonstration. We begin at the morbid anatomy.

they form a more or less dense, shrivelled, grayish, semitransparent cicatrix, which is often flecked with pigment. . . .

. . . More or less extensive collections of fluid are left behind in the framework of the cicatrix, and lead to the formation of single or multiple, large or small cysts. They usually contain a muddy fluid resembling milk, or more frequently serum.

In many cases, on the contrary, the interstitial supporting framework becomes in course of time greatly hypertrophied and consolidated. It increases in thickness and density; the vessels become larger, and their walls thicker; the previously softened spot becomes firmer and denser, gray, and semitransparent, and presents a marked contrast in colour and consistency to the surrounding parts.

Page 396.

In the first stage we find marked dilatation of the capillaries and small arteries, and more especially of the small veins; they are distended with blood, and not unfrequently enveloped in layers of white and red blood-corpuscles arranged in the form of a sheath.

Marked changes are always found in the neuroglia. The fibres of the reticulum are thickened and swollen; the network is much denser and more distinct, and it is in part filled with nuclei and cells. The glia cells themselves are swollen and increased in number; they often contain several nuclei. . . . We generally find granule-cells in greater or less numbers, partly in the immediate neighbourhood of the vessels, partly scattered irregularly in the interstitial tissue and its meshes.

Ross, *Ibid.*, p. 237.

. . . A gray or grayish-yellow discoloration may be observed along the posterior median fissure extending almost the entire length of the cord.

Page 238.

. . . In the inferior portion of the lumbar enlargement there is frequently only a slight gray discoloration in the external half of the posterior columns; but on ascending it increases in width, so that in the upper half of the lumbar enlargement the discoloration embraces the entire transverse section of the posterior columns. The whole of the posterior columns are usually affected throughout the entire length of the dorsal region, but its extent diminishes again in the cervical portion, and the degeneration becomes limited in the upper cervical region to the columns of Goll. As a rule, the intensity and extent of the morbid process is greatest in the upper lumbar and dorsal portions, diminishing both upwards and downwards from these points.

If the reader will now take up the symptoms, he will find that nearly every sentence in Ross's account is to be found in Erb's. The only place where Erb is credited with any statement is on page 224, where his name appears in brackets. We might illustrate the method of manufacture by some extracts, but we have devoted enough space to these few pages. In Chapter III. of the second volume, at page 511, Ross begins the consideration of "focal diseases" by an account of "Occlusion of the Cerebral Arteries." In *Ziemssen's Cyclopædia*, vol. xii., this topic is discussed by Nothnagel. We find here a close correspondence, but, as Ross gives much less space to the subject, he more often paraphrases. As a specimen of this, and to exhibit the mode of his bibliography, we quote the following:—

Ross, p. 517, vol. ii.

Experimental Investigations.

The first experimental researches with respect to the embolic process were undertaken by Virchow, and great additional light has been thrown on the subject by the important experimental and microscopical investigations of Cohnheim. Panum studied experimentally the results of occlusion of cerebral vessels with the view of determining the manner in which death is caused. B. Cohn investigated experimentally various clinical and anatomical points; Feltz studied the results of capillary embolism; while Prévost and Cotard made a series of experiments with the view of determining the relation of occlusion of cerebral vessels to softening.

ERB, *Ibid.*, p. 531.

. . . We may recognize a gray or yellowish-gray discoloration along the posterior median fissure, at both sides of the same, extending almost throughout the entire length of the spinal cord.

Page 532.

. . . In the lowest lumbar division we often see but a slight gray discoloration in the external half of the columns; this increases in width as we ascend, until finally, in the upper half of the lumbar enlargement, the entire transverse section of the posterior columns appears discoloured; this then generally continues upwards throughout the entire dorsal portion, again to diminish in the cervical portion, and finally to be limited to the columns of Goll. In the majority of cases, therefore, the rule holds good that the intensity and extent of the process is greatest in the upper lumbar and the dorsal portions, diminishing both upwards and downwards from these points.

NOTHNAGEL, p. 193, vol. xii.

Experimental Investigations.

The first experimental inquiries into the subject of thrombosis and embolism . . . we owe to the labours of Virchow. . . . That Panum studied the occlusion of cerebral vessels, especially with the view of determining the manner and cause of death; that B. Cohn investigated experimentally various clinical and anatomical points; whilst Feltz treated particularly of capillary embolism. Prévost and Cotard made a series of careful experiments bearing upon the subject of the obstruction of cerebral arteries, and its relation to softening; and, finally, the important experimental and microscopic investigations of Cohnheim. . . .

Next turn to "Thrombosis of the Cerebral Sinuses," Ross, p. 518, *Ibid.*, and Nothnagel, p. 209, *Ibid.*

ROSS.

History.—Special attention was first directed to the subject of thrombosis of the cerebral sinuses by the observations of Tonnelé. Many valuable clinical observations with regard to the disease were made by Puchelt, and the attention of Lebert was also directed to it. The treatises of Von Dusch, B. Cohn, and of Lancereaux helped greatly to extend and to systematize our knowledge with respect to this thrombosis; and in more recent times our knowledge has been further increased by the labours of Gerhardt, Griesinger, Corazza, Heubner, and Huguénin.

If the reader will compare the sections on "Etiology," he will find not only paraphrases, but entire sentences copied. The following may serve as a sample :—

ROSS, p. 519.

Cohn observed a case in which suppurative phlebitis of the cavernous sinuses occurred in connection with purulent inflammation of the deep muscles of the neck.

Every statement contained in Ross's account of the "Morbid Anatomy," on page 522-23, is contained in Nothnagel's account of the same subject, and much of it is *verbatim*. An equally close correspondence is to be discovered in the section on "Symptoms." In the chapter on "Occlusion of the Cerebral Capillaries," the opening and many subsequent sentences are appropriated.

ROSS, p. 523.

Experimental investigations have shown that marked disturbances of the cerebral functions may be caused by occlusion of the cerebral capillaries. . . .

Symptoms.—The experiments of Feltz and of Prévost and Cotard show that extensive embolism of very fine particles may rapidly induce death in animals by causing diffuse anæmia of the brain.

Morbid Anatomy.

Capillary occlusions are, of course, only to be detected with the microscope. Delacours says that, in cases of lime metastasis, a resistance is felt to the knife in cutting through the brain, and rough prominences may be felt on the surface with the finger.

NOTHNAGEL.

. . . The credit of having formulated it as a specific disease belongs to Tonnelé. The investigations of Puchelt did not receive the notice which they deserved; those of Lebert on inflammation of the cerebral sinuses attracted more attention, and the more recent treatises of Von Dusch, B. Cohn, and Lancereaux assured to thrombosis of the sinuses . . . and at the same time and at later periods our knowledge of the disease . . . was increased through the labours of various observers; we would refer particularly to those of Gerhardt, Griesinger, Corazza, Heubner, and Huguénin.

NOTHNAGEL, p. 212.

B. Cohn observed a case in which suppurative phlebitis of the cavernous sinus occurred in connection with purulent inflammation of the deep muscles of the neck.

A series of experimental investigations has shown that the extensive occlusion of cerebral capillaries may give rise to even very marked disorders of the cerebral functions.

NOTHNAGEL, p. 223.

A series of experimental investigations has shown that the extensive occlusion of cerebral capillaries may give rise to even very marked disorders of the cerebral functions.

Symptomatology, p. 227.

. . . Through the experiments of Feltz, Prévost, and Cotard, that extensive embolism of very fine particles may in animals rapidly induce death, resulting from the diffuse anæmia of the brain.

Pathological Anatomy, p. 226.

The occlusion of the capillaries is, of course, only to be detected with the microscope. . . . In lime metastasis, according to Delacour's description, a resistance is felt to the knife in cutting through the brain . . . while on the cut surface itself small, rough prominences are to be felt with the finger.

We find the same unacknowledged appropriation of material in all parts of the work devoted to morbid anatomy, symptoms, etiology, etc. The various chapters in the volumes of *Ziemssen's Cyclopædia* devoted to diseases of the nervous system have furnished this material. Of the rest of the work, we have before indicated the sources of supply. The expressions of opinion, the names of contributors to particular questions, have alike been obtained by Dr. Ross from these works. He does now and then report a case and express his views, it is true, but his contributions to the subject-matter of the two volumes may be included in less than fifty pages. To call the work "*A Treatise on the Diseases of the Nervous System by James Ross, M.D.*," seems to us an assumption not warranted by the state of facts above given. In the first paragraph of the preface, Dr. Ross states that "it would be invidious to single out for special mention a few of the many authors I have had occasion to consult; I must, therefore, ask them all to accept the simple acknowledgment conveyed in the insertion of their names in the text." Invidious, truly! The authors referred to owe the insertion of their names in the text to the writers from whom Dr. Ross has appropriated it.

R. B.

ART. XXXI.—*A Treatise on Human Physiology, designed for the Use of Students and Practitioners of Medicine.* By JOHN C. DALTON, M.D., Professor of Physiology and Hygiene in the College of Physicians and Surgeons, New York. Seventh edition. 8vo. pp. 722. Philadelphia: Henry C. Lea's Son & Co., 1882.

A NEW edition of this popular text-book will be heartily welcomed by teachers and students, and all the more so when they find a new issue, not only without increase in size, but with an actual reduction of nearly 100 pages. This in itself indicates that there has been a process of judicious winnowing, which a careful comparison with the last edition shows to have been admirably effected, without any material sacrifice.

The section on Physiological Chemistry—always a well-arranged and useful one—has received thorough revision. The old term proximate principle has been abandoned, and much new matter added, particularly on the ferments and albuminous substances. We miss and regret, under "Digestion," the familiar figures illustrating useful points in the comparative anatomy and physiology of this process. The recent observations of Heidenhain, Kühne, and others on the nature of gastric and pancreatic digestion have been incorporated, and there is a pleasing absence of doubtful minutiae, so confusing to the student. In discussing the coagulation of the blood no reference is made to the important part believed to be played by the colourless corpuscles, or to Buchanan's original investigations, which, as Gamgee has shown, anticipated the more recent views of Schmidt. The chapter on the circulation presents very few changes; a new cut and more extended description of the normal sphygmographic tracing would have been advantageous. Why is there no account of the physiological anatomy and histology of the kidney? We have frequently heard students and others refer with surprise to this omission. The chapters on the nervous system have been carefully revised, and the

author expresses himself strongly in favour of the modern views on cerebral localization. Justice is scarcely done to the opponents of these theories; indeed, they are not even mentioned. The chapter on the sympathetic system has been in great part rewritten, though here, too, we are surprised that the important observations of Goltz are not referred to. The section on reproduction has long been regarded as the strongest in the book. The general standard is maintained in this edition, and new matter has been incorporated. A reference to the early changes in the germ and the mechanism of fecundation, as worked out by several recent observers, would have been appropriate, and the important contributions of Leopold on the physiology of menstruation would have added to the value of the section.

An excellent feature in this edition is the number and beauty of the figures; many of the old ones have been re-cut, and the new ones are of very superior finish. Altogether the work is in every way worthy of the confidence which teachers and students have given it during the past twenty-five years.

W. O.

ART. XXXII.—*A Text-book of Practical Medicine, with Particular Reference to Physiology and Pathological Anatomy.* By Dr. FELIX VON NIEMEYER, Professor of Pathology and Therapeutics, Director of the Medical Clinic of the University of Tübingen. Translated from the eighth German edition, by George H. Humphries, M.D., and Charles E. Hackley, M.D. In two volumes, pp. 767 and 861. Revised edition. New York: Appleton & Co., 1881.

A GLANCE at the prefaces to this edition of Niemeyer's well-known Practice, and a comparison of the dates therein set down, cannot fail to arouse the interest of him who gives heed, even in the most general way, to the course of the medical literature of the day.

Over date of Tübingen, October, 1867, the author, in his preface to the fourth edition, informs us that nearly ten years elapsed since the first appearance of his work. Over date of New York, May, 1880, his translators, in their preface to the edition under consideration, among other matters of interest relating to the history of the book, recall the fact that Niemeyer died in 1871, "in the prime of life and mental vigour," *about fifty years of age.*

This text-book, accepted as such all over Germany, where it reached a seventh edition within ten years, and where it still holds its own—known in the original or by translation as a standard work the world over—now reissued in America after a quarter of a century, useful, vigorous, welcome, almost fresh, whilst scores of text-books upon practice have appeared, proved useless, feeble, unwelcome, and stale from their inception, and have been forgotten—this book, if these dates be correct, was given to the world when its author was about *thirty-six years of age.* Well may his translators say that his death at fifty was a great loss to the medical profession! Well may they lament his untiring industry, his rare experience, his great abilities as a teacher! The names that are conspicuous in medicine are the names of men whose industry sprang from the enthusiasm of youth, whose abilities as observers and teachers were

wedded to the vigour of early manhood, and whose experience is to be measured by its fibre rather than by its length. Bright among these names is that of Felix von Niemeyer, of Tübingen.

Some years after his death, an edition of his book was brought out in Germany. The changes in the text were extensive, and much new matter was added. The book, in consequence of the condensation thus rendered necessary, lost much of the charm of style and description that it had owed to the author's pen. The translators have adhered as closely as possible to the original manner, and whilst drawing freely upon the last German edition, have made no attempt to make a close translation of it. They have also made such additions from other sources as appeared to them "*calculated*" to render the work more useful to the "American reader." Among these additions are brief articles upon "Chronic Poisoning by Alcohol and Morphine, as well as upon Wandering Spleen, Paralysis Agitans, Scleroderma, Elephantiasis Græcorum, and Progressive Pernicious Anæmia." A chapter upon Yellow Fever has also been added. This, we are informed, has been compiled chiefly from Bartlett's "Fevers of the United States," edited by Alonzo Clark.

In a full notice of the translation of 1869, which appeared in this Journal in January, 1870, testimony was borne to the excellence of the translation, and the manner in which the work was issued. In the present issue there is no falling off in these matters.

The plan of the work does not include general introductory considerations upon pathology and therapeutics. The first volume treats of diseases of the respiratory organs, of the circulatory organs, of the organs of digestion, of the liver and bile-ducts, and of the spleen. The first chapter begins with the consideration of hyperæmia and catarrh of the mucous membrane of the larynx. The second volume deals with diseases of the urinary organs, diseases of the male and female sexual organs, of the nervous system, of the skin, of the organs of locomotion, and with constitutional diseases.

The progress of medical literature during the last ten years, its specialization and organization, have brought the quarters of the medical world into close and rapid intercommunication with each other, and German modes of thought in science, and German views upon matters of pathology and therapy have no longer the air of newness that they wore when Niemeyer's work first came among us. Moreover, clinical medicine has meanwhile made great gain of knowledge, not alone through investigations within the boundaries of her own proper domain, but also within the provinces of physiology, pathological anatomy, and applied chemistry. Important questions have been settled, obscure points made clear, false theories done away with, errors brought to light, and facts accumulated until the mass of knowledge is beyond the grasp even of a master intellect, and comprehensive treatises upon medicine must henceforth be the work of several authors working together, each in his separate and limited sphere; in other words, for purposes of reference, the system must take the place of the text-book, and the system must not only be new, but it must be constantly renewed.

For these reasons this translation of Niemeyer, too bulky and not quite recent enough for the student, cannot be regarded as desirable as a book of reference for the active clinician, the "busy practitioner," as the professional reviewer, who writes much, reads little, and too often does not see any patients at all, is apt to call his more fortunate brother in medicine.

The well-written additions of the revision fail to bring it up to the standard required by a profession whose unsparing work makes it a niggard of time. Niemeyer's work, despite its graphic descriptions, its lucid and attractive style, its fulness of fact, of thought, its ineffaceable stamp of intellectual vigour and originality, or by very reason of all these, must take its place among medical classics, a monument of its author's greatness. There, where it now rightly belongs, the less tinkering it has had since the hand that wrote it laid it down, the more valuable will it be, and he, who in the future shall desire to know Niemeyer, will turn not to the greatly improved and altered edition of Dr. Seitz, nor to the American translation of 1880, but to the last editions in which the revisions are the work of the author himself.

To-day, when the announcement of the observations of Dr. Koch has bent anew the energies of pathologists upon the subject of the origin of consumption and tuberculosis, the familiar theories of Niemeyer assert their importance.

J. C. W.

ART. XXXIII.—*Health Reports.*

1. *Fifth Annual Report of the Board of Health of the State of New Jersey*, 1881. Mount Holly, N. J. pp. 344.
2. *Fourth Biennial Report of the State Board of Health of Maryland*, January, 1882. Frederick, Md. pp. 212.
3. *Annual Report of the Board of Health of the State of Louisiana to the General Assembly for 1881*. New Orleans, 1882. pp. 427.
4. *Third Annual Report of the State Board of Health of Illinois; with the Official Register of Physicians and Midwives for 1880*. Springfield, 1881. pp. 325.

1. THE *New Jersey Health Report* is, as we might anticipate from its being the production of such an eminent sanitarian as Dr. Ezra M. Hunt, replete with useful facts and valuable suggestions worthy of the high place which public hygiene has attained in modern civilization.

As remarked by Dr. Hunt:—

“The care of the public health is no longer regarded as merely a professional concern, or one of generous patronage. The welfare of the State and its highest material interests depend very much upon how far it promotes the health and life of the citizen. It is *political economy* that requires the closest attention to the subject. It has been said that the progress of a people can be tested by the exactness of the attention given to the prevention of preventable diseases. It would seem as if the test were a safe one, for the greatest progress in statistical inquiry, and in the provision of State oversight, has been made by those who in other respects are admitted to be the most prosperous.”

It is gratifying to learn from the Report that the judicious improvements in drainage on a large scale at Bound Brook, where it may be remembered that a widespread epidemic of malarial fever, in 1880, attracted public attention, have almost entirely obviated this source of disease; and that any recurrence of the typhoid fever epidemic at Princeton, so disgraceful, so *shameful*, to an institution claiming its high rank as an educational centre, is probably provided against by an improved system of water supply and sewerage.

Encouraging progress is stated to have been made in the important work of inspecting the condition of the hotels at the many sea-side resorts on the New Jersey coast, particularly in regard to the disposal of sewage and the provision of means for escape in case of fire.

An effort of the very mildest kind has been inaugurated to regulate medical practice in the State by requiring practitioners to register and exhibit their diplomas, so that, without indorsing all these as competent physicians, the law demands that, in so serious and important a business as the special care of human life, the person who offers his services as a physician or surgeon must at least have the testimony of some incorporated school or licensing body that the necessary preliminary studies have been pursued. Reasonable complaint is expressed that the inspection of milk and the examination of foods, etc., suspected of being adulterated, are incomplete for want of a sufficient appropriation from the Legislature.

The first paper, entitled *The Relation of the State Board of Health to our Public School System*, by Laban Dennis, M.D., of Newark, is an earnest plea in favour of systematic instruction in anatomy, physiology, hygiene, and general sanitary science in all grades of schools and educational institutions. In arguing against the supposed impracticability of this project, however, the author does not seem to be aware that, on the continent of Europe, as, for example, in the city of Brussels, Dr. Janssens has had in operation an even more complete plan for the sanitary care and instruction of pupils in the public schools, with eminently satisfactory results.

This essay is followed by interesting articles on *Typhus Fever at Camden County Almshouse*, by the Secretary; *Facts as to the Abatement of the Bound Brook Malaria*, by C. M. Field, M.D.; and *Citations from the Law Relating to Nuisances*, by E. S. Atwater, Esq.

The separate reports of the members of the Council of Analysts, which come next in order, give evidence of a great amount of labour on suspected foods, drugs, etc., performed, too, largely as a matter of charity to the State, the compensation being totally inadequate. Among the more important results we note that tea and coffee were found generally pure, candies and spices were as generally adulterated, while sago and tapioca were entirely fictitious, being largely made up of corn starch (for which the careless blunder of "Tea mais starch" in the report is doubtless intended).

The Secretary further contributes instructive papers on *Animals as Related to Human Disease*, and *the Care of the Public Health*, and on *A Study of Consumption as a Preventable Disease*, which, with reports on vital statistics, circulars and laws, climatology, and a catalogue of the valuable library belonging to the board, make up the remainder of the volume.

2. In the *Maryland Report* the detailed account of the work of the Board by the industrious Secretary, Dr. C. W. Chancellor, opens with a just and earnest tribute to the memory of Dr. Edward L. Howard, whose ability as a sanitarian renders his death a serious loss to the cause of sanitary science in this country. Considerable difficulty seems to have been found in establishing local health boards under the auspices of the State organization, but, thanks to the tireless efforts of the Secretary in arousing public attention by personal visits, hygienic lectures, etc., a majority of the counties in Maryland are now furnished with this important

means for the preservation of health. Dr. Chancellor's report also contains much excellent advice in regard to disinfection, value of vaccination, protection against typhoid fever, scarlatina, diphtheria, and on kindred topics.

Following the tables of vital statistics, and statements of some of the local health boards, appear sundry papers contributed by eminent medical gentlemen of Maryland. The first of these, by Prof. S. C. Chew, M.D., of the University of Maryland, on the *Avoidable Causes of Bright's Disease*, contains a strong plea against the abuse of alcohol, as one of the most common and dangerous foes to the integrity of the renal organs. A second essay on *Water, and the Water Supply of Cumberland, Md.*, by Dr. D. P. Welfley, comprises the results of numerous samples of spring, well, cistern, and river waters, many of which were found to be suspicious or unfit for use. The third paper, on *Physical Education*, is furnished by Dr. Joseph T. Smith of Baltimore, and enunciates the same old but ever needed warnings against the neglect of due *bodily* for excessive *mental* exercise.

An appendix, giving much judicious and timely popular information on sundry hygienic subjects, has been compiled by Dr. Chancellor from the Reports of the Massachusetts and Michigan Health Boards, and other original sources of sanitary knowledge; and the volume closes with an interesting account, also by the Secretary, of the Epidemic of Diphtheria in Frederick City, and of Smallpox in Charles Co., Md.

3. More than one-third of the *Louisiana Health Report* is taken up with the further presentation of Dr. Jos. Jones's side in his unfortunate quarrel with the National Board of Health. In it we find expressed in eloquent and forcible language the same bitter complaints of personal liberty invaded, individual judgment disputed, and constitutional rights assailed, which Prof. Jones has, we doubt not, often cut short, as they were poured out by unhappy patients and their luckless comrades, whom he has imprisoned in smallpox hospitals, or shut up in yellow fever quarantines sorely against their will.

The really sanitary portion of the report, commencing on p. 120, considers first the admirable effort made by Prof. Jones, as President of the Board of Health, to restrict the *sale of poisons and the adulteration of food* in New Orleans. Poisoning by cyanide of potassium is illustrated by some interesting cases and an extended series of experiments upon animals, as is also the subject of poisoning by carbonic oxide and other gaseous impurities of the air. In his investigation of the different kinds of sugar and molasses in the New Orleans market, Dr. Jones concludes that the Louisiana is superior in every respect to the Cuba or the northern molasses; and that from an economic point of view five pounds of glucose should only cost as much as two pounds of sucrose or cane sugar. Dr. Jones also points out the dangers from adulterated milk and infected meat, judiciously urging the systematic inspection of these two important articles of diet, which does not appear to have been as yet practised in New Orleans.

Section fourth of the report is devoted to the *preventable causes of diseases* and deaths arising from the infectious and contagious diseases. Under this head Dr. Jones treats at some length of yellow fever, in regard to which his extended experience of twenty-seven years renders his opinion of especial value. He declares that the older statements that yellow fever

never extended above a height of 2500 feet are shown to be incorrect; that, however violent the disease may be at any place, "it is arrested from the day on which the earth is frozen, and such localities may then be visited with impunity by strangers," that it is contagious, and as a general rule occurs but once during life. In regard to the prophylactic treatment, our author declares that "experience has established the possibility of excluding yellow fever from localities in which it has prevailed as an epidemic, subsequent to its introduction from other regions, by means of an absolutely strict quarantine. But hitherto it has been almost impossible to arrive at any definite conclusions as to the value of quarantine in those regions in which the disease is endemic and indigenous." As to the value of disinfectants, he thinks it very doubtful whether much of the benefit claimed for them is not due to other causes, and in regard to quinine he maintains that it is of use rather as an antidote to the effects of the poison, than of the poison itself. Though no efforts have been made in New Orleans to control the spread of venereal disease, Dr. Jones urges the question upon the attention of the Governor and Legislature, correctly maintaining that much good will be accomplished by the institution of a proper system of medical inspection, treatment, and police regulation of prostitutes.

Voluminous tables, etc., giving the meteorological, vital, and mortuary statistics of New Orleans, and pointing out the progress of sanitary reform, occupy Section V. of the Report; Section VI. is made up of the reports of sanitary inspectors, quarantine officers, and other officials; and the last ninety pages of the volume contain the detailed proceedings of the Board, which give evidence of a vast amount of useful sanitary work, chiefly, if not wholly, performed by its indefatigable and industrious President, Prof. Jones.

4. Nearly five-sixths of the *Illinois* Report is made up of the official register of physicians and midwives, to whom certificates have been issued by the State Board of Health. This list of 5596 practitioners, who minister to the bodily ills of the 3,078,636 inhabitants of the State, may not be quite so instructive to sanitarians generally as health reports usually are, and yet it represents an extraordinary amount of careful and fruitful toil on the part of the officials, which must be more prolific to the people of the State, in the preservation of life and health than many far more pretentious essays.

The volume opens with the report of the able Secretary, Dr. John H. Rauch, comprising the abstract of proceedings, and special statements in regard to canal and river improvements, on the Medical Practice Act, and on general sanitation. From these we learn that nine of the certificates formerly granted had been revoked during the year for cause, chiefly unprofessional conduct, in some cases of a very flagrant character. Some of the medical colleges accused of selling diplomas without study, or after insufficient study, had been further investigated. Six of these institutions had raised their standard, and improved their course of instruction; but thirteen had been definitely rejected as not in "good standing," and their diplomas refused.

A most important document is the report of a committee appointed to recommend a standard which shall be required of colleges to entitle their diplomas to be accepted by the Illinois Board of Health. In order to fulfil their duty this committee addressed a circular of inquiries to the

medical colleges of the United States, and to numerous eminent medical gentlemen, which elicited eighty-seven replies. Upon the basis of these the committee advise that a medical college, to be considered in "good standing," must require a preliminary examination or its equivalent; must include in its courses of instruction (besides the usual seven branches), "8. Hygiene and sanitation; 9. Medical jurisprudence;" must demand attendance on at least eighty per cent. of the lectures, in two full courses of five months each, not within the same year; and must compel each student to study three full years, dissect during two courses, and attend two terms of clinical and hospital instruction. This report was unanimously adopted, so that after the medical college session of 1882-83 it becomes the rule of the Board, and will, we hope and believe, do more to protect the people of Illinois from ignorant and knavish quacks, in the guise of true physicians, than any measure which has hitherto been instituted by sanitary authorities in this country. An instructive table, opposite p. 46, showing the courses of study, etc. of colleges whose diplomas are recognized, informs us that of the 45 regular medical schools there mentioned 18 require an examination to be passed in "Hygiene and Sanitation," as a necessary condition for graduation. J. G. R.

ART. XXXIV.—*Supplement to the Descriptive Catalogue of the Pathological Museum of the Pennsylvania Hospital.* By MORRIS LONGSTRETH, M.D., one of the Attending Physicians and Pathologist and Curator to the Pennsylvania Hospital, etc. pp. 219. Philadelphia: Collins, Printer, 1882.

WITHOUT a good descriptive catalogue a museum is of very little use; with one, it at once becomes an important means of study and instruction, more so, indeed, than is usually recognized. Any one who has attended a museum class at one of the London medical schools can appreciate the amount of practical information in medicine and surgery which can in this way be imparted. But in the absence of a systematic method, any intelligent student, with a good catalogue in his hand, can devote profitable hours to study of this sort. Unfortunately, there are catalogues and catalogues; some are little more than transcripts of the labels on the jars; others are concerned almost exclusively with the descriptions of the specimens; whereas the typical catalogue gives a *résumé* of the history, as well as a detailed account of the preparation. To this last division belongs the one of the Museum of the Pennsylvania Hospital, prepared by Dr. Longstreth, which forms a supplement to the Descriptive Catalogue prepared by Dr. Pepper in 1869, and contains an account of the specimens added since that date. We once heard a master in the profession say that he judged a hospital by the way in which the post-mortem work was done; and there is much truth in the remark, for careful clinical men know full well that the key to many of the problems at which they work is to be found in the dead-house. This catalogue may be regarded as describing the more interesting specimens obtained from the hospital during the past ten years, and it shows at once the intimate relationship which exists between clinical and pathological work in this institution. A striking feature of it is the prominence given to clinical details; in almost every

instance, after a statement of the condition of the specimen, and an explanation of what it shows, the history of the case is given in brief. We do not remember to have seen any catalogue in which this excellent practice has been carried out to the same extent. We congratulate Dr. Longstreth and the hospital on the way in which this work has been performed. We had occasion lately to go through some ten pathological museums of the different schools and hospitals in this country, and were in a position, on arriving at the Pennsylvania Hospital, to appreciate fully the advantage of a good catalogue.

W. O.

ART. XXXV.—*Causes of Deafness among School Children, and its Influences on Education, with Remarks on the Instruction of Pupils with Impaired Hearing, and on Aural Hygiene in the Schools.* By SAMUEL SEXTON, M.D., Aural Surgeon to the New York Eye and Ear Infirmary, Member of the American Otological Society, etc.
Circular of Information of the Bureau of Education, No. 5, 1881.
 Washington: Government Printing Office, 1881.

HON. JOHN EATON, Commissioner, says, in a letter dated Washington, Sept. 24, 1881, and addressed to the Hon. Secretary of the Interior, "The causes of deafness among school children are numerous and important enough to justify a special investigation of the subject," and he therefore requested Dr. Sexton to prepare a paper on this subject. Dr. Sexton has accordingly presented in this valuable brochure the more practical conclusions regarding the causes of deafness among school children, together with suggestions of a hygienic and prophylactic nature drawn from his own observations among a large number of pupils in dispensary, hospital, and private practice.

He also gives a brief description of the structure of the ear, together with its physical and physiological functions, wood-cuts of its deeper and invisible parts, and a most excellent description of the sympathetic relations between the teeth and the ears, because *diseased states of the former have so great an influence on the acoustic organs, especially of the young.*

Pages 11 to 16 inclusive alone would make this brochure so valuable to the general practitioner as to justify him in going to the trouble of sending to Washington for a copy, for in these pages the causes of many cases of deafness are set forth most plainly, and the *modus operandi* of cold in the head explained in the only scientific way.

Not only are the causes of cold in the head and consequent deafness explained most lucidly, but a preventive hygiene is marked out, so that teachers as well as parents will do wisely in reading it and carrying it out. Then there follows a graphic account of the unfortunate results of incapacitating deafness, and their ramifying evils throughout the various avocations. Thus the partially deaf child is slighted in his education, and falls short of the attainments otherwise possible to him. But what is still more important is that teachers who are partially deaf are now and then found only imperfectly fulfilling their duties. "Should an instructor himself be defective in his hearing sense, and yet unaware of the fact, it would be easy for him to unjustly censure children for incompetency in

the course of instruction, or in examinations for promotion, simply because their responses were not heard." He, therefore, suggests that "persons desirous of acquiring a pedagogical education at the public expense should be subjected to an aural examination before they are accepted, and in the appointment of teachers in the public schools the ability to hear well should be a requisite." (p. 25.)

When alluding to aural hygiene in the schools, Dr. Sexton says, "When we are appealed to as humanitarians to provide hospital accommodations for the poorer class, no means are spared in the planning and erection of healthful buildings for their use, but when school-houses are to be constructed—when both body and mind should be aided in development, prepared, I may say, to enter the struggle for 'the survival of the fittest'—their erection is, I fear, too often intrusted to the political contractor, whose knowledge in building is chiefly confined to 'making it pay.'"

The author then discusses the mistake of paying all attention to heating a school-room, and *none* to ventilation, the insufficient clothing of some school-children, and the excessive clothing of others, and the evils arising from out-door bathing. He further calls attention to the evils of mouth-breathing, directs us what to do when foreign bodies get into the ear, deprecates boxing the ears, and alludes to the misfortune of having a school-room so near a street as to be disturbed by its noises. The physical well-being of a child is often interfered with by the foulness of a discharging ear, and his mental condition greatly depressed by the knowledge that the offensive smell of his ear renders him an object to be avoided, not only by his fellow-pupils, but even by his teachers. From a purely cosmetic treatment, therefore, in such cases excellent moral results would accrue to patient, fellow-pupils, and teachers. We most heartily recommend this pamphlet to the careful attention of the profession.

C. H. B.

ART. XXXVI.—*A Case of Ectropion Successfully treated by Transplantation of Skin from the Arm and Forearm.* By LOUIS H. FOSSWILL, M.B. 12mo. pp. 10. London: J. & A. Churchill, 1882.

THIS pamphlet is a fuller account of a case already reported at the British Medical Association, but is worthy of notice from the character of the operation, and the success which followed it.

A boy, aged 10, had been so severely burned some years before as to have complete eversion of both left eyelids and the lower lip. The left cornea was inflamed and opaque, and the right opaque and staphylomatous, with some eversion of the lower lid. The left eye remained staring wide open during sleep. No healthy skin was available for a flap. Accordingly, after dissecting loose the two left eyelids, Mr. Fosswill pared their edges and united the lids by sutures. He then cut from the right arm and forearm, with a sharp knife, two semicircular pieces of skin, one $2\frac{1}{4} \times 1\frac{1}{8}$ inches, the other two-thirds as large, and placed them on the upper and lower raw surfaces. Each piece was freed from all areolar tissue and fat, and secured in place by fine silk sutures. Gold-beaters' skin, cotton-wool, and a bandage completed the dressing. On removal of the gold-beaters' skin on the sixth day the union was so firm that some stitches were removed,

and the remainder two days later. On the twelfth day the lids, which had united firmly, were separated, and the cornea was found greatly improved. Dressings were continued for five weeks. The upper ectropion was completely cured, the lower nearly so.

Mr. Foss will recommends that the large skin graft be cut with a knife instead of scissors; that it be 50 or 60 per cent. in excess of the surface to be covered, so as to allow for shrinkage; that all areolar and fat be dissected off, even at the risk of loss of heat by the flap; that the sutures be numerous and fine, and that the dressings be but little interfered with, and continued for some weeks, with a view to warmth if nothing else. The gold-beaters' skin is of the greatest use in preventing the displacement of the flap, an irreparable disaster.

This extension of the experience of Reverdin and Ollier with the skin and periosteum promises to be very useful in the future. Our own essays with it have not been so successful, but we have learned much from our author's experience.

It is to be regretted that no illustrations accompany this interesting and instructive case.

W. W. K.

ART. XXXVII.—*Human Osteology, comprising a Description of the Bones, with Delineations of the Attachment of the Muscles, the General and Microscopic Structure of Bone and its Development.* By LUTHER HOLDEN, assisted by JAMES SHUTER. 8vo. pp. xii., 309. Pl. lxi, and wood-cuts lxxxix. Sixth edition. Philadelphia: Presley Blakiston, 1882.

THE appearance of a sixth edition of this well-known and excellent monograph is a healthy sign. We welcome it anew, and with the greatest pleasure both for its own and its author's sake. We heartily wish that more of our anatomical plates were not only as good, but as creditable to the author's skill as draughtsman, as these by Mr. Holden. It is a pleasure to see on each recurring lithographic plate, "From Nature by L. Holden." Besides a few minor improvements in this edition a few brief notes on Comparative Osteology have been added which, though not new or extensive, add immensely to the value of the book. This is especially so to any London student, for all these references are accompanied by the number of the illustrative specimen in the splendid museum of the Royal College of Surgeons. Mr. Flower has lately rearranged the museum specimens with precisely the same object in view. Each bone of the human body has grouped with it typical specimens of the corresponding bone from as many of the lower animals as are accessible. In this manner the entire skeleton can be studied with the greatest possible help from Comparative Anatomy. Mr. Holden has made his book a companion volume to the museum.

Why could not the same be done in this country by the Mütter Museum in Philadelphia, the Museum of Comparative Anatomy in Cambridge, and others?

W. W. K.

QUARTERLY SUMMARY
OF THE
IMPROVEMENTS AND DISCOVERIES
IN THE
MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

Anomalies in the Arterial System.

Dr. J. G. WILTSHIRE reports the case of a negro in whom dissection showed some curious anomalies. The heart was found on the right side, with its base at the proper level, corresponding with the upper borders of the third costal cartilages, with its apex pointing to the right, resting on the diaphragm at a point corresponding with the space between the fifth and sixth ribs. It was normal in size and appearance.

From the left side of the heart the arch of the aorta came off and in every way behaved as it ought to have done, save in giving off its branches. The arteria innominata was wanting, its branches coming off from the arch in the following order :—

The right common carotid arose from the upper face of the transverse part of the arch, where it begins to descend toward the third dorsal vertebra, and then it ascended, in front of the trachea, to the right side of the neck to its usual point of bifurcation into the external and internal carotids; the former gave off no branches until it reached a point opposite the symphysis of the chin, where a short axis was thrown off, from which the facial, lingual, and superior thyroid arteries arose. The latter (internal carotid) presented nothing that was at all irregular in its behaviour.

The left common carotid artery was derived from the outer face of the descending part of the arch, and ascended, upon its old bed, to its usual point of bifurcation, acting as did its fellow on the opposite side.

The left subclavian arose from the descending part of the arch of the aorta, at a point where it crosses, and passed upward and outward to its usual line of passage to the anterior border of the first rib (Wilson).

No more anomalies occurred in the arterial tree until it passed into the abdomen, where the celiac axis came off from the posterior face of the aorta and passed to the right of the latter to its front, where the hepatic, gastric, and splenic arteries were given off. There were two renal arteries on the right side, whereas there was only one on the left.—*Maryland Medical Journal*, Nov. 15, 1881.

Relation of the Peripheral Vaso-Motor Centres to Temperature.

LEWASCHEFF (Pflüger's *Archiv*, vol. xxvi. p. 60) subjects to renewed experimental inquiry the contradictory statements regarding the action of heat and cold on the vessels. According to most observers, the primary effect of cold is constriction, that of warmth dilatation. According to the later observations of Dziedzjul, the reverse is the case, namely, constriction in a medium above 15° Cent. (59° Fahr.), dilatation below 15°. The author experimented upon amputated limbs of dogs, in which an artificial circulation of defibrinated blood was maintained. Nerves and muscles then remained excitable at the end of eight to ten hours, during which period spontaneous contractions were occasionally observed; he judged of the calibre of the vessels by pressure, by rapidity of outflow, and by temperature. He comes to the conclusion that increase of temperature causes dilatation, and diminution of temperature constriction; and that the greater the increase, the greater the dilatation, and the greater the diminution the greater the constriction. These results did not occur with dead limbs, and the changes were, therefore, due to vital activity of the arterial walls. In order to determine the share in the changes of vaso-motor fibres and centres, the author experimented on limbs of which the nerves had been cut a month previously to insure their complete degeneration; the changes were as before. Seeing that Samkovy and Gruenhagen (*Archiv*, 1874, p. 399; and 1879, p. 165) have shown that smooth muscle relaxes with diminution of temperature, and contracts with increase of temperature, the author attributes the above changes to peripheral centres, and not to direct action on the arterial muscle.—*London Med. Record*, April 15, 1882.

Influence of the Nervous System on the Lymphatics.

MM. PAUL BERT and LAFFONT, in a note communicated to the Académie des Sciences, point out that the lymphatic vessels behave, in the presence of physical excitants, exactly as do the bloodvessels. All are agreed in referring the dilatation and contraction of the latter to the influence of the nervous system, but no one has hitherto endeavoured to ascertain whether the lymphatic vessels are under the same influence. The authors have, therefore, made experiments in order to ascertain whether this is the case. The abdomen of an animal during the process of digestion was opened under tepid water, so as to avoid the influence of the air and cold on the abdominal lymphatics. The mesenteric nerves were then stimulated electrically, and on this the lymphatic vessels were observed gradually to shrink and disappear. In another animal the splanchnic nerves were similarly stimulated by a voltaic current so feeble that when applied to the tongue it could scarcely be perceived, and the same vessels were then seen to swell and to become turgescient. If the pneumogastric nerves were divided and the peripheral extremities stimulated, besides the peristaltic movement of the first part of the intestine, there was observed first a transient dilatation, and then a considerable and permanent dilatation of the lymphatic vessels. It seemed important to ascertain whether the same effects could be produced in curarized animals. Claude Bernard showed that the pulsation of the lymphatic hearts of the frog ceases under the influence of curara at the same time as the function of the motor nerves of the muscles is suspended. Experiment shows that the same effect is not produced on the lymphatic vessels. Under normal conditions, when the mesenteric nerves are stimulated the lymphatic vessels contract; but under the influence of curara, stimulation of the mesenteric nerves, or of the splanchnic nerves, causes dilatation of these vessels. It is, however, necessary to ask whether the change in the size of the lymphatic vessels may not be a secondary effect of

the action of the nerves stimulated, upon the blood-pressure in the intestinal vessels. To this an answer is supplied by further experiments, which show that the changes in the lymphatics are entirely independent of the condition of the bloodvessels. The section of the mesenteric nerves which causes turgescence of the bloodvessels does not interfere with the normal course of the chyle, and causes no modification in the size of the chyloferous vessels. Nor has ligature of the arteries any influence on the size of the related lymphatic vessels. Some experiments have also been made on larger animals, the ass and the horse. In these, under the influence of electrical stimulation of the peripheral extremity of the trigeminus, the lymphatic vessels of the upper lip were observed to become varicose, and to form a pale prominence beneath the mucous membrane. The investigators have also succeeded in reproducing, in the chyloferous lymphatics and thoracic duct of the dog, the experiments of Gubler on the veins of the hand. A slight tap on the vessel caused a narrowing which passed gradually onwards and was succeeded by dilatation.—*Lancet*, April 29, 1882.

Pancreatic Digestion.

The functions of the pancreatic secretion in the process of digestion have been considerably but by no means exhaustively studied. A fresh series of experiments on the subject has been made by M. DUCLAUX, and described in a paper which he has communicated to the Académie des Sciences. The facts he mentions deserve notice, although they are not altogether novel. A small fragment of the pancreas will liquefy starch, leaving intact only the outer capsule of the starch grain, which is also unaffected by the diastase of germinating barley. This external capsule, if isolated, is not coloured blue by iodine unless treated also with sulphuric acid. It is variable in thickness in different kinds of starch, and seems thus to consist of true cellulose. Except this residue all the starch is dissolved. Duclaux thinks the action is too rapid to be attributed to a ferment. He points out also that the action of the pancreas on albuminoid material is not at present very clearly understood. If one or two milligrammes of pancreas are introduced into ten cubic centimetres of milk, the liquid, at the end of a few hours, is no longer coagulated by acids, even nitric, nor by acidulated ferrocyanide of potassium, and it is, moreover, clear. The pancreas thus plays an important part in the digestion of milk, which may be one of the reasons why milk diet is so useful in diseases of the stomach. In cooked meat, under the same conditions, the muscular fibres are broken up, especially towards the extremities, where they are not protected by the sarcolemma. The interfibrillary substance becomes dissolved, and so the fibrillæ become separated. The difference in action of the gastric juice and pancreatic secretion may be roughly summarized by stating that the former breaks up the fibre transversely and the latter longitudinally. But the effect is not limited to this longitudinal dissociation. The cooked meat is gradually transformed into alimentary pulp, which closely resembles that produced by the gastric juice, but there is never complete solution, although the tissue elements which resist are too small to permit their actual nature to be determined. It is clear, however, that the pancreatic juice has no power than that of the stomach to digest indifferently the various albuminoid bodies. Another fact points to the same conclusion. The fragments of the pancreas themselves remain unchanged even after a very prolonged sojourn in the stove. Contrary to what is sometimes asserted, the pancreas cannot digest itself. When this takes place, it is only through the agency of the organisms of putrefaction. This presents a fresh instance of the law that every living cell consists of elements which are impregnable in its vital conditions to the ferments which it may secrete.—*Ibid.*, April 29, 1882.

The Changes in the Composition of Saliva in Different Diseases.

Dr. SAMUEL FENWICK read a paper at the meeting of the Royal Medical and Chirurgical Society on March 28th, on the presence of bile in the saliva, and on the variations in the amount of sulphocyanide of potassium in the saliva of persons affected with different diseases. The author commenced by stating that it is generally believed that in cases of jaundice the saliva does not contain any of the colouring matter of the bile. He has, however, found a yellow colouring matter in the saliva of every case he has examined, after evaporating it by means of a gentle heat. A bitter taste is often complained of by patients affected with jaundice, and it has been suggested that it might result from the presence of the biliary acids in the saliva. The author has not been able to prove whether this opinion is correct or not, but he details a case in which an intense bitterness was complained of by a person unaffected with jaundice, in whose saliva he found traces of the biliary salts by the ordinary tests. Having proved that both the colouring matter and the salts of the bile occasionally presented themselves in the saliva, an attempt was made to ascertain whether the amount of the sulphocyanide of potassium usually present in the saliva varies in different diseases, and whether such variations coexist with any particular diseases. For this purpose, the saliva was examined in a large number of patients treated in private and hospital practice, and the results were afterwards analyzed. As it had been stated by some physiologists that the sulphocyanide was only the result of decomposition, set up in the saliva by decayed teeth, and by others that it was produced by tobacco-smoking, these two conjectures were first examined. The state of the teeth was carefully remarked in eighty-seven hospital patients, and it was found that there was no relation between the amount of decay in them and the quantity of the sulphocyanide in their saliva. The habits of 213 persons were inquired into respecting their use of tobacco, and it was found that the amount of the sulphocyanide was not affected by the habit of smoking. The quantity of sulphocyanide was almost always deficient in cases of jaundice arising from obstruction; thus, of twenty-three cases, it was very deficient in eighteen, and in some scarcely a trace could be found. From this the author conjectures that the amount of this salt in the saliva depends on the quantity of the bile that reaches the intestines; a conclusion that seemed to be supported by two cases of hepatic fistula, in both of which it was also very deficient. Where jaundice was absent, one of the chief circumstances that appeared to regulate the amount of the sulphocyanide was the quantity of food taken by the patient; thus, it was always deficient in œsophageal stricture, and in cancer of the stomach. Persistent vomiting, diarrhœa, and dysentery produced a similar result, probably by removing the food before it could be fully digested. It was also deficient in cases of severe atonic dyspepsia, and in all cases of chronic disease where the appetite was very bad. The sulphocyanide was found to be in excess in fat persons and in those who were gaining flesh; deficient in those who were thin or rapidly losing weight. It was greatly in excess in all cases of acute rheumatism (thirty-six cases examined), and reached the maximum in the second week of the disease. It was also in excess in all the cases of acute gout, and in most persons liable to what are termed "bilious headaches." In the early stages of all inflammatory disorders there was an excess, for instance, in gastric catarrh, in acute pleurisy, erysipelas, diseased kidneys, and in phthisis, but it sank below the average in the later stages of these diseases. The author points out that the fibrine of the blood has been found to be in excess in most of the above diseases, such as acute rheumatism, gout, erysipelas, and acute inflammations, and he suggests that an unusual amount of sulphocyanide in the saliva is perhaps the consequence of an excessive excretion of unoxidized

sulphur, resulting from the large amount of albuminous material of the blood that has been altered by the inflammatory process, and thereby rendered unfit for organization into healthy tissue.—*Med. Times and Gaz.*, April 15, 1882.

Renal Secretion.

SENATOR (*Verhandl. der Physiol. Gesellsch. zu Berlin*, Jahrg. 1881-2, No. 6) has recently reviewed the various theories which have been put forward during the last few years with respect to the share taken by the various parts of the apparatus in the kidney for separating the different elements of the urinary secretion. His conclusion affirms those views which have found general acceptance in this country. He believes that the blood-pressure determines the rate of secretion from both the Malpighian tufts and the epithelium of the tubules. He regards the process in the Malpighian body as one of simple filtration, and rejects the view that the epithelium covering the tufts acts as a secreting parenchyma. He thinks we must admit that some water is secreted, together with the salts, by the epithelium of the convoluted tubules. A certain amount of albumen may be present accidentally as a transudate through the walls of the Malpighian tuft. He thinks the following factors determine its presence: the conditions, especially the thickness of the membrane, the concentration of the solution (*i. e.*, the blood), its saline contents, its temperature, and the filtration-pressure. The urine, according to Senator, is a mixed solution, the result of, in part, transudation from the bloodvessels, in part of secretion by the glandular epithelium of the kidney.—*London Med. Record*, April 15, 1882.

MATERIA MEDICA AND THERAPEUTICS.

Administration of Belladonna to Children.

DR. JULES SIMON, in a lecture delivered at the Hôpital des Enfants-Malades (*Gaz. des Hôp.*, January 5 and 10), observes that belladonna is a medicine that is often employed with success in children, who in general bear it very well, just as adults for the most part tolerate it badly. The doses which he recommends are the result of the almost daily use of the drug, either in his hospital or private practice. As examples of its efficacy, he alludes to its use in four cases, one of them occurring as far back as 1871, so that the employment of belladonna is no new thing with him. This case occurred in a boy three years and a half old, the subject of intense whooping-cough, to whom he gave, on March 7, thirty drops of the tincture of belladonna to be taken in the twenty-four hours. On the 8th he ordered forty drops, and next day sixty, always in the same space of time. This last dose was continued daily until the 19th, not only without any accident, but with great improvement in the cough. In two other cases, in boys four and three years old respectively, the dose given varied from fifty to sixty drops in the twenty-four hours; and in a girl thirteen years of age, with bad paroxysms of the cough, beginning with ten drops per diem, he gradually increased the dose to 120, without the slightest accident arising.

The powder and extract of belladonna are two preparations that may be very well associated so as to make very small pills, each containing a centigramme of extract and one of powder; and these pills are found very useful in combating the tendency to constipation in chlorosis. The dose of the tincture may be

graduated as follows: From two to three years of age, five to ten drops; three years, ten to twenty drops; and above three years, thirty to forty drops per diem, always, however, at this last age commencing with ten drops. The dose should in all cases be divided into two portions. Below the age of two the tincture is given only quite exceptionally, and then at a year old in doses of five drops per diem. Of the syrup the daily dose is one or two teaspoonfuls (*i. e.*, five to ten grammes) for a child two years old, and two, three, or even four teaspoonfuls for one of three years. To the adult are generally given two tablespoonfuls, or about thirty grammes. When the neutral sulphate of atropia is employed, half a milligramme per diem should be given to a child two years old, gradually increasing the daily dose to two milligrammes. Belladonna may also be employed externally, as in arthritis and coxalgia, when a liniment may be formed of four parts of extract of belladonna and six of extract of henbane with *q. s.* of oil of henbane. Sometimes also the extract of belladonna is added to mercurial ointment; and an ointment composed of neutral sulphate of atropia twenty to thirty centigrammes and benzoinated lard thirty grammes is very useful in relieving or even removing muscular pains in certain cases. "Belladonna is, then, a very active and in general well-tolerated remedy; and of all the preparations we have referred to, the tincture in medium doses of ten drops for a child two or three years old is the most employed, as also the syrup in doses of one or two teaspoonfuls for a child of the same age. I much prefer these two preparations to the neutral sulphate of atropia."

Turning to its physiological properties and therapeutical indications, belladonna may be described as an irritant substance to the parts upon which it is deposited. Taken internally, it induces thirst, dryness of the throat, with bitterness, and a certain acidity. Sometimes it gives rise to a semi-paralysis of the pharynx, and sometimes even to a kind of dysphagia. In poisonous doses it gives rise to nausea and vomiting, like opium itself. But while the action of this last on the intestinal canal is characterized by constipation, belladonna, on the contrary, produces hypersecretion from the mucous membrane of the canal, and slight painless contractions—that is, diarrhœa. Belladonna has a sedative action on the circulation, producing in a therapeutical dose a diminution of the pulse and calorification; while in a poisonous dose it gives rise to febrile accidents and a notable elevation of temperature. Preparations of belladonna produce on the skin almost a scarlatiniform eruption of uniform redness. Their action on the respiration is to diminish the secretion of the respiratory mucous membrane, the rapidity of respiration, and the play of the thorax, diminishing also the sensibility of the nerves. But when given in large doses, at the same time that these induce vomiting and fever they increase the movements of the thorax. Transpiration is not increased by belladonna, which again in this differs from opium; and it is the same with the urine, which is increased in quantity. It is a nerve *par excellence*, exciting the central nervous system. In a somewhat larger dose it produces cephalalgia; in a stronger dose, vertigo, intoxication, subdelirium, with great loquacity; and in a poisonous dose the delirium becomes more intense, and even furious. Opium is the opposite of this, depressing the nervous system. It acts on the pupil by "decongestioning" and dilating it; again the opposite of opium. On this ground it is supposed to render the brain anæmic, while opium seems rather to produce its congestion. Finally, in a therapeutical dose it diminishes the susceptibility of the nerves of sensibility, and in a poisonous dose it gives rise to the phenomena of tetanism. To sum up: the principal action of belladonna is to produce diarrhœa, to diminish calorification, to increase the renal secretion, to maintain the nervous system aroused, while rendering the central nervous system anæmic.

As to the diseases in which belladonna is indicated, Dr. Simon states that in

simple acute laryngitis, in stridulous laryngitis, in intense laryngitis with spasms, raucous cough, etc., he prescribes a mixture of equal parts of the tincture of the roots of aconite and belladonna, giving ten drops per diem to children two or three years of age. In spasmodic and paroxysmal bronchitis, in bronchial adenopathy, in whooping-cough, and in influenza, he also orders belladonna in combination with aconite. If the child is nervous and very excitable, he also associates with the syrup of belladonna (ten grammes) syrup of codein (ten grammes) and eight or ten drops of tincture of aconite, obtaining thus the benefit of both opium and belladonna, their antagonism not being so complete as to prevent their advantageous association in some forms of disease, especially such as are attended with respiratory spasm. Belladonna is also of service in emphysema, in asthma, and in suffocative paroxysms. On the other hand, its employment is absolutely proscribed in pneumonia and broncho-pneumonia. In affections of the digestive organs, especially those met with in nervous little girls, already almost hysterical, with their intellect developed beyond their age, and who are already little actresses, who have anæsthesia of the skin, complain of severe pains without obvious cause, and who suffer from gastralgia, dyspepsia, and sometimes vomiting; in such patients, after trying laudanum, blisters, douches, and ice, he gives belladonna, in spite of the cerebral irritation which exists, in doses of a teaspoonful of equal parts of syrup of belladonna and syrup of codein. When children are growing up and suffer from constipation, which accompanies abdominal neuralgia, he gives before meals a pill consisting of a centigramme of powder and one of extract of belladonna. In tenesmus, ointments combined with belladonna generally succeed, and they are also of use in appropriate cases of nocturnal enuresis. In young girls of thirteen to fifteen, in whom the establishment of menstruation is difficult and is accompanied by erratic pains, a liniment composed of four grammes of the extract of belladonna, six of the extract of henbane, and thirty of the oil of henbane may be applied to the hypogastrium, and then covered with a cataplasm. The pains are by this relieved without the ill effects produced by opium enemata on the menstrual process. Belladonna, formerly much employed in epilepsy, has of late been superseded by the bromides; but in some cases in which these last have been found to fail, advantage has been derived from giving for a fortnight one or two milligrammes of powder of the neutral sulphate of atropia, and following this up for another fortnight with strychnia. In zona and in facial neuralgia of rheumatic origin belladonna may be employed for the relief of the severe pains. In affections of the eye it is of use in diminishing the contraction of the pupil, as also in catarrhal or purulent conjunctivitis, especially when followed up by quinine. It is an error to regard it as a preservative from scarlatina.

“Belladonna, then, is a means which may be very usefully employed in the affections of the respiratory organs already indicated, in diseases of the digestive canal (when neither enteritis nor diarrhœa exists), in affections of the nervous system, in zona, in facial neuralgia, and in diseases of the eye.”—*Med. Times and Gaz.*, March 11, 1882.

Chloroform Water.

In an article in the *Gazette des Hôp.*, March 25, attention is drawn to a highly useful preparation of chloroform for internal use, made by the simple addition of water, and one which will favour the more extended employment of this useful agent. Profs. LASÈGUE and REGNAULD have shown, after due investigation of the subject, that this is the only preparation to be relied upon; and that the solubility of chloroform in water does not exceed 9 per 1000. This solution is

obtained by pouring an excess of this substance into a bottle three parts full of distilled water, shaking the mixture repeatedly, and then allowing the insoluble chloroform to deposit until complete transparency is obtained. The separation of the saturated solution is then made by decantation, or by means of a siphon. This, however, being too strong for internal use, requires dilution with 9 per 1000 of its weight of water. Various salts (as chlorate of potash, borate, bicarbonate and salicylate of soda) may be dissolved in this water without producing any modification; and Profs. Lasègue and Regnaud are of opinion that chloroform-water, either pure or diluted, will meet every need of the internal administration of this substance. Giving a pleasant taste in the mouth, which lasts for a minute or two, it is well calculated to disguise the unpleasant taste of various medicines, as castor oil, etc.; and by the direct action which it exerts on the mucous membranes and other surfaces with which it comes in contact, it may prove useful in certain affections of the mouth, gums, teeth, velum, pharynx. Swallowed, it exerts a stimulant action on the stomach, but it acts differently according as it is taken before, during, or after a meal, and according to the lapse of time that has intervened between taking the meal and the absorption of the chloroform. Given before a repast, in aid of the appetite, the chloroform-water is a bad agent; but given after a meal, whether alone or combined with an alcoholic wine and sweetened, it increases the stimulant properties of the wine or produces the same effects. Wherein this water enjoys an incontestable efficacy, which is proper to it, is when it is administered for combating the multiple affections which supervene during the course of digestion and produce its disturbance. Its maximum therapeutical action is obtainable three or four hours after the meal, when functional disturbances exhibit themselves by yawning, distension, gaseous eructations, a sense of epigastric pressure or heaviness, flushings of the face, and threatenings of vertigo. But in a higher degree still, when the digestive disturbances are manifested by acute lancinating pains of the stomach, oppression, palpitations of the heart, fleeting febrile action, dryness of the mouth, painful tympanites, etc., the action of the chloroform-water is injurious, this period of the indisposition being ill-suited for any stimulant whatever. In a word, the chloroform-water acts on the stomach in the same calming way as upon the interior of the mouth, and if it do not cure the affection, at least it attenuates its consequences. It is the remedy for the crisis, but not dispensing with the requisite principal treatment. It is a remedy eminently suitable as an efficient calmant of the sufferings which ensue from painful digestion in dilatation of the stomach.—*Med. Times and Gazette*, May 6, 1882.

Therapeutic Value of Resorcine and Chinoline.

Dr. BRIEGER (*Deutsch. Med. Zeit.*, Feb. 2, 1882) has carried out experiments on resorcine and chinoline in the clinic of Dr. Frerichs, and gives the results in a paper read on January 30, at the meeting of the Verein für innere Medicin. Resorcine was first recognized as a check to decomposition and fermentative processes and as a powerful antiseptic, by Andeer, and it was believed that there was no external disease in which it did not prove effective. Brieger has, however, got no good result from even a 5 per cent. solution in gonorrhœa. Internally, he tested its antifermentative and antipyretic qualities in typhus and pneumonia, and found that doses of $1\frac{1}{2}$ grammes lowered the temperature somewhat; however, the larger number of the patients thus treated fainted easily, complained of tinnitus aurium, and exhibited startling delirium. In a few patients the pulse became small and soft, the heart's impulse less strong; heavy rigors and perspirations followed, and, lastly, collapse, from which they were with difficulty recovered.

If the dose were pushed beyond 3 grammes, symptoms analogous to poisoning by carbolic acid were observed; whilst the lowering of temperature only lasted a short time, to be succeeded, in from one and a half to two hours, by increase of fever and temperature, to even a higher degree than before. The nausea was also very objectionable. It might be suggested that, as small doses lowered the temperature for a time, larger doses could be administered to lengthen the effect; but against this is the fact that resorcine is excreted as ether and sulphuric acid, and only a part is further oxidized and forms coloured products of oxidation. Hence, as resorcine is administered, the body becomes poor in sulphuric acid, and receives bodies which act as poisons on it. As an antipyretic, therefore, this drug is not to be recommended on any account. It has also been lauded in intermittent fever; but, as in well-constructed hospitals this fever is observed to pass over favourably without medication, Brieger has not administered resorcine to the patients. He has used the other agent chinoline, without the slightest effect in typhus, pneumonia, rheumatism, and remittent fever; it being in some cases vomited, thereby probably reducing the temperature very slightly. It has also had effects following its administration, *e. g.*, disturbances of digestion, vomiting, and nausea; so that it does not seem advisable to use chinoline in its present form. Hiller has made similar observations, which were extended to phthisis and enteric fever, with like results, using the tartrate of chinoline, which is very insoluble and of a very disagreeable taste, producing vomiting in three-fourths of all the patients to whom it was given; he has therefore abandoned it. Guttman used resorcine as a wash for the bladder in chronic cystitis in three patients, in whom it caused intense pains and hæmaturia with renal elements, which at once ceased when salicylic acid solution was used. He trusts that such washings-out with resorcine will never be undertaken again. Brieger, lastly, is astonished that Soltmann recommends it for children with stomachic ailments.—*London Medical Record*, April 15, 1882.

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Detection of Small Amounts of Iodoform and Substances Yielding Iodoform.

On heating an alkaline solution of resorcin with even very small amounts of iodoform a red coloration is produced which again disappears on the addition of an acid. This reaction may be readily employed for the detection of small amounts of substances yielding iodoform, as alcohol, acetone, etc. As is known, such substances are recognized by warming the liquid to be examined, adding a solution of iodine in potassium iodide or potassium carbonate, and then sufficient solution of sodium hydrate, drop by drop, until the brownish-yellow colour is nearly discharged. On agitation and standing, the iodoform separates as a bright yellow crystalline precipitate, which, under the microscope, appears in the form of regular six-sided tables of roundly-pointed laminae. As on the one hand small amounts of iodoform remain dissolved, particularly in alcoholic liquids, and on the other hand the microscopic examination of the precipitate is somewhat circumstantial, it is recommended to gently warm the liquid containing iodoform, obtained by the above method, with the further addition of alkali and a little resorcin. The above-mentioned characteristic red coloration of the liquid then appears.—*Cincinnati Lancet and Clinic*, April 29, 1882, from *Pharm. Centralhalle*.

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The Convulsive Properties of Morphia.

The *Gazette Hebdomadaire* contains an interesting note by MM. GRASSET and AMBLARD on the convulsive properties of morphia. Opium contains, as is well known, two series of alkaloids of very different properties, of which thebain and morphia are types. In certain points of view, however, the physiological re-

sults produced by these alkaloids are not entirely dissimilar; for example, it has been found that morphia, as well as thebain, may possess convulsive properties when given to cold-blooded animals. MM. Grasset and Amblard have found an analogous result in the warm-blooded animals; when one or two centigrammes are injected hypodermically, slight transient convulsions are produced before sleep occurs. When larger doses are given, these transient convulsions are succeeded by a generally calm sleep, during which, half an hour or an hour after the injection, isolated contractions occur, which may pass into a form of clonic convulsion, with marked flexion of the body, occurring at each inspiratory movement. These results seem to indicate that the excito-motor effects produced by preparations of opium may not only be due to the convulsive alkaloids, but also to those which are generally regarded as soporific.—*Revue Scientifique*, March 25, 1882.

The Effect of Bleeding on Inflammation.

The effect of local abstraction of blood in relieving local inflammation is one of the ancient doctrines of therapeutics which is still unrefuted and still unexplained. It was formerly held that the result was produced by a perfectly simple *modus operandi*. By the removal of blood from the surface the vessels of the deeper inflamed parts were partly emptied; but it was later recognized that this explanation is incompatible with the known conditions of the circulation. The local removal of blood never produces a lasting effect on the circulation in the part. At the present time it is generally assumed that the effect of local depletion is to remove the inflammatory stasis, although such an effect has never been demonstrated experimentally; and, moreover, the idea of a derivatory action still haunts the theory of the subject, while the effect is sometimes ascribed to the influence of the depletion on the whole mass of blood. The question has been lately subjected to experimental investigation by Genzmer and Nikolas of Halle, and the results obtained have been described by the former in the *Centralblatt für d. Med. Wiss.* In the web of the foot of curarized frogs foci of inflammation were excited by punctiform cauterization, either by nitrate of silver or a red-hot needle, and the process was watched with the microscope. When the well-known phenomena of inflammation made their appearance, the aggregation and exit of the white corpuscles, retardation of the blood-current, and, finally, the formation of stasis, a leech was applied to the leg. As soon as the leech began to suck, a striking change occurred in the inflammatory process in the foot. The blood-current became quickened, and carried on the corpuscles which were adherent to the wall. The stasis passed away, and in a few minutes the inflamed capillaries were cleared, and presented to the end of the experiment a normal and even accelerated circulation. Whether the corpuscles which had already wandered out of the vessels were influenced by the abstraction of blood could not be with certainty determined. In some experiments scarification was employed after the focus of inflammation had been excited. The effect was less conspicuous, since the loss of blood did not occur with the same vehemence as with a leech, although the amount of blood abstracted was nearly the same. The effect of abstraction of blood from the general circulation, by opening an abdominal vein, was still slighter, although the amount of blood taken was considerable. The conclusion drawn from these experiments is that the antiphlogistic action of local abstraction of blood is produced by a purely mechanical agency. A temporary augmentation of the circulation occurs, by which the capillaries are cleared; and the stasis, which is the first step in a local necrosis, is removed. Not only is no local anæmia produced, but there is actually an arterial hyperæmia; there

is an increased supply of arterial blood to the focus of inflammation, which, besides its effect on the bloodvessels, may reasonably be supposed to improve the nutrition of the tissues, and so to counteract the tendencies of inflammation. The antiphlogistic action is clearly proportioned both to the amount of blood withdrawn and to the rapidity of its withdrawal, and its action is notably greater if the blood can be withdrawn from the circulation between the region of the inflammation and the right side of the heart.—*Lancet*, April 15, 1882.

MEDICINE.

The Etiology of Tuberculosis.

The discovery originally made by Villemin, that tuberculosis could be transferred by inoculation to the lower animals, though frequently confirmed, has been as often denied; so that even now, in spite of the positive experiments of Cohnheim and Salomonsen, Baumgarten, Tappeiner, and others, the greatest doubt exists as to whether tuberculosis is actually an infective disease or not. The recent experiments of ROBERT KOCH, however, appear to establish beyond doubt, the truth of the infective nature of this morbid process. After abandoning the old methods of examination, which failed to give any satisfactory proof of the presence of bacteria in tubercle, he succeeded in perfecting a method of staining, by means of which he was able invariably to find a characteristic bacillus in all tubercular tissues.

The tissues are prepared in the ordinary method for similar observations, and either spread on a cover slip and then dried and heated, or the sections of the organ are cut after previous hardening in alcohol; the cover glass or section is then immersed for twenty-four hours, when cold, or one hour when heated to 40° C., in a staining fluid of 1 c.c. of a concentrated alcoholic methylin-blue added to 200 c.c. of distilled water, to which, after repeated shaking, 0.2 c.c. of a 10 per cent. solution of potash is added. The cover glasses or sections are then covered with a concentrated aqueous solution of vesuvium, and after about two minutes washed in distilled water. By this means the blue staining of the tissue is transformed into brown while the bacteria retain their bright-blue colouration, in which, with the exception of the lepra bacillus, they differ from all other bacteria.

The bacteria demonstrated by this process are rod-shaped, and, therefore, belong to the group of bacilli. They are very thin, and about one-fourth or one-half as long as the diameter of a red blood-corpuscle, although they may attain a much greater length. They closely resemble the bacteria of leprosy, but are distinguished from them by being somewhat narrower and more pointed at the ends, besides being incapable of being stained by Weigert's process.

These bacteria are found in all localities where the tubercular process is active, and are arranged in heaps, often in the interior of the cells, as occurs with the lepra bacilli, though numerous free bacteria, especially at the borders of such collections, are also found. When the height of the tubercular process has been reached, the bacilli are then found in smaller numbers and in small groups, associated with faintly coloured and scarcely recognizable bacilli, which have probably died or are then passing into an inactive condition. When giant-cells are found in tuberculous tissues, these bacteria are nearly always to be found in their interior, and when the tubercular process is slow, this is the only locality in which

they are to be found. Dr. Koch succeeded in detecting these bacteria in eleven cases of tuberculosis occurring in man, not only in the tubercular nodules in the lungs, but in the tubercular infiltrations of the spleen, liver, kidney, and pia mater. Twelve cases of pneumonia and bronchitis were also examined, with the result of the detection of the bacilli not only in small groups at the edge of the tubercle, but more abundantly in cavities, where they were associated with other bacterial forms from which they were readily distinguished by their behaviour with vesuvin. They were also found occupying the usual situations, as indicated above, in ten cases of bovine tuberculosis, and in the bodies of three monkeys dying from tuberculosis. A very large number of experiments were made with inoculations of tubercular matter from various sources, and in 172 guinea-pigs, 32 rabbits, and 5 cats, the entire number experimented with on this point, the characteristic bacilli were found in the lungs of the injected animals. His culture experiments, sterilized ox-blood serum being used as the cultivating fluid, furnish the most satisfactory proof as to these bacilli being the causative influence of tuberculosis. Small quantities of tubercular matter were added to this culture fluid and maintained at a temperature of 40° C., the access of other organisms being prevented for ten days, when fine white spots were noticed to form on the surface of the serum, which under the microscope proved to be the developing bacteria. When a small quantity of this infective fluid was injected into the anterior ocular chamber of guinea-pigs, and even cats and dogs, which do not ordinarily become tubercular, general tuberculosis made its appearance in about ten days, and ran a rapid and fatal course.

Several points of contrast were noted between the conditions necessary for the development of these and other bacteria, the most marked being that they require a temperature of from 30° to 40° C., and can, therefore, not develop outside of the body, thus differing from the parasitic cause of splenic fever.

Having thus proved the parasitic nature of tuberculosis, Koch attempts to explain the origin of these bacteria, and the manner in which they enter the organism. As regards the latter point, their great abundance in cavities could readily cause their presence in expired air, which would be thereby contaminated, and serve as a means of conveying the disease to others; they were also found in the sputa of phthisical patients, which, even when dried, retains its virulence, and the power of producing general tuberculosis, when introduced into the circulation.—*Berlin Klin. Woch.*, April 10, 1882.

Relapsing Fever.

An extensive epidemic of relapsing fever prevailed at Königsberg during parts of the years 1879–80, lasting, in all, about fifteen months, and during that time no less than 360 cases were under treatment at the municipal hospital. An account of the chief facts of these cases, which has been published by Dr. MESCHÉDE in Virchow's *Archiv*, contains many details of value regarding the clinical history of the disease. A very remarkable feature of the epidemic is the great preponderance of males among those who suffered. Although males usually suffer more than females, the ratio, in ten thousand cases collected by Murchison, was only ten to six, whereas, at Königsberg, the proportion of males was 85 per cent., and of females only 15. This unusual feature was chiefly due to the prevalence of the disease in the low lodging-houses and prisons, and among tramps. As in other epidemics, a large number of the patients (one-half) were from eighteen to thirty years of age, and this special prevalence of the disease at the period of life at which the power of resisting morbid agencies is greatest, shows how much the influence of contagion preponderates over predisposing conditions.

In the month in which the epidemic of relapsing fever reached its height, exanthematic typhus made its appearance, but certain facts observed showed very clearly that there was no direct relation between the two diseases. Two patients were seized with relapsing fever at the end of an attack of typhus, but in four patients typhus developed while they were under treatment for relapsing fever. The cases observed presented very different degrees of intensity and course. Some were so slight that, had it not been for the prevalent epidemic, their nature would scarcely have been suspected; 58 of the cases had only one febrile attack, 120 had two, 107 had three, 7 had four, and 2 had five distinct attacks. The total mortality was near the average, about 7 per cent. Almost all the fatal cases presented grave complications—pneumonia, the symptoms of the so-called “bilious” variety, delirium, etc.; and *post mortem* there were also found meningitis, abscess of brain, pericarditis, fatty-degeneration of the liver, infarction and suppuration in the spleen, tuberculosis of the lungs and intestinal tract. Death occurred most frequently in relapses after the first, very rarely during the first relapse or during the primary attack. The duration of the individual febrile periods was, for the first, six or seven days; for the second, four or five days; for the third, three or four days; for the fourth, one or two days; while the fifth attack did not exceed one day in duration. The first intermission lasted for seven or eight days, the second nine or ten days, the third eleven or twelve days. These periods are rather longer than those noted by other observers.

The highest temperature was usually attained on the last day, or the last day but one, of the first relapse—*i. e.*, immediately before the second remission; the highest temperature observed was 107° in two cases. The greatest pulse frequency was observed at the same period. The greatest fall of temperature at the end of a relapse was from 104.2° to 92.2° , or a fall of twelve degrees. Cutaneous complications were observed in a few cases, erysipelas, lichen, miliaria, herpes, boils, and carbuncles; roseola was observed in cases complicated with exanthematic typhus, but in no case of uncomplicated relapsing fever. Glandular swellings were noted in a few cases only. Diarrhœa was present in nearly half the cases, but was usually a late symptom, the early stage of the disease being marked by constipation, which in a few cases existed throughout. In 8 per cent. of the cases jaundice was present, and pneumonia occurred in nearly the same proportion. Epistaxis was also present, but occurred chiefly at the onset of the disease. Delirium was relatively infrequent, being noted in only 36 cases. Convulsions, opisthotonos, and paralysis of one arm were noted as rare complications on the side of the nervous system. Disease of the middle ear was found in 15 of 180 cases especially examined (8 per cent.), and intraocular affections in 6 cases (or $3\frac{1}{2}$ per cent.).

The spirillæ of relapsing fever were found in almost every case during the attack, and also in the cases of the “bilious” variety, the “bilious typhoid” of German writers. In one of the latter cases they were found, twenty-four hours after death, in large quantities in the blood of the hepatic vein. In several of these cases an enormous enlargement of the spleen was noted, and the follicles were found to be in a state of purulent liquefaction.—*Lancet*, April 15, 1882.

Treatment of Yellow Fever by the Permanganate of Potash.

It is well known that the Mexican government has offered a prize of five hundred thousand francs (cien mil pesos) to the discoverer of a specific for yellow fever, and we learn from the *Chron. Med. Quir. de la Habana*, Feb. 1882, that Dr. ROSADA claims to have found a treatment which, if not specific, at least is successful in saving a large number of cases.

The method presupposes the necessity of oxygenating the large quantities of carbon in the blood produced by the microscopic vegetable organisms which are formed and then decompose in the blood. For this purpose, the oxygenation of the inspired air and the frequent use of baths and injections of permanganate of potash, so as to admit of the absorption by the skin and rectum of oxygen, which is so readily yielded by this substance. It is also recommended the food should be salicylated.

This treatment of Dr. Rosada does not fulfil the conditions required to obtain the prize offered by the Mexican government, since it is directed towards the effect and not the cause of the disease. It seems, however, to deserve serious attention.—*Journ. de Méd. de Paris*, April, 1882.

Symptoms of Trichinosis in Man.

Prof. GERMAIN SÉE describes four forms in which this disease may occur in man: the gastro-intestinal, rheumatoid, œdematous, and typhoid. The gastro-intestinal form is characterized by diarrhœa and vomiting, and, although the symptoms might indicate cholera, the absence of the peculiar rice-water discharges, and, above all, the presence of profuse sweating and great muscular prostration, serve to prevent the diseases being confounded.

In the rheumatoid form, great muscular pain and feebleness are the characteristic symptoms; in later stages other symptoms may arise from the invasion of the muscles of the larynx and chest by the parasite.

The œdematous form is more characteristic. A unilateral œdema of the face, with great prostration, gastro-intestinal trouble, and rheumatic pains, and without albuminuria or heart disease, is almost pathognomonic.

The typhoid form closely resembles typhoid fever, from which it is principally distinguished by the profuse sweats, œdema of the face, and rapid fall of the fever. Nervous symptoms, such as numbness, tingling in the limbs, are generally slightly marked.—*Journ. de Méd. de Paris*, Feb. 25, 1882.

A New Tract of Spinal Degeneration.

Dr. HADDEN, at the meeting of the Pathological Society of London, held April 4th, showed microscopical specimens, taken from a small fragment of the upper cervical region of the cord, which was given to him by Professor Greenfield. The specimen, which had been lying by in spirit for nearly two years at the Brown Institution, was said to have been taken from a patient suffering from locomotor ataxy. Unfortunately he had been unable to get the clinical history of the case. The value of the observation was, therefore, purely pathological. In front of each crossed pyramidal tract—in that part of the cord known as the anterior root-zone, or Flechsig's fundamental region of the lateral columns—is a symmetrical area of degeneration. No other change, either in the gray or white matter, is visible. Although the case was supposed to be one of locomotor ataxy, the posterior columns are quite intact. The degeneration does not appear to be due to overgrowth of the neuroglia, but is apparently granular. Under a moderately high power there are seen at the boundaries of the degenerative area swollen axis-cylinders, together with amyloid bodies. The latter are probably artificial, and depend on the way in which the specimen has been preserved. The morbid area itself seems to consist of a confused mass of granular *débris*. The bloodvessels are thickened, and in some parts contain numerous blood cells. As to the significance of this degeneration, little can be said in the absence of the clinical history. It is almost certain, however, that it is not secondary to a cerebral lesion, for in that case we should expect a unilateral and not a double spinal

lesion. It is impossible to say whether it is a primary spinal lesion, or secondary to disease either of the cord itself or of the peripheral nerves. The lesion is probably ascending, for no trace of degeneration was found in sections made at a higher level than that at which the section shown this evening was taken. In his work on "Diseases of the Spinal Cord," Dr. Gowers figures a degenerative tract which is identical in position with the one just described. In this case the lower end of the cord had been crushed. There was secondary degeneration of the columns of Goll, as well as of the tract just referred to. In the case of Dr. Gowers, sensation was profoundly impaired; and hence he infers that some form of sensation is conducted in this region. As yet, the existence of this tract is supported only by these two observations. In his recent work on "Spinal Localization," Charcot remarks that the region in front of the crossed pyramidal tracts has hitherto not been found the seat of system-degeneration. Dr. Gowers, who has seen the specimens now shown, believes that the degenerative area are identical in position with those figured and described by himself.

Dr. GOWERS observed that he was not quite certain whether the degeneration was the same as in Dr. Hadden's specimens. The tract, he said, had not exactly the same form in both cases, and it was impossible to say whether they occupied precisely the same region. If they were the same, then Dr. Hadden's case was of great interest, as tracing up the degeneration a little higher than he had himself been able to do. Degeneration of the medulla in this region had not often been observed, but he believed that it was an ascending degeneration, and involved a tract of fibres concerned with the conveyance of sensory impressions. This view was confirmed by some recent observations of Flechsig.—*Med. Times and Gaz.*, April 22, 1882.

Spasms of Muscles of Neck.

Dr. SAMUEL CABOT reports the following case of spasm of the muscles of the neck occurring in a type-setter, aged twenty-nine. His family and personal history exceptionally good. Physique better than the average. April 28, 1878, after six months of uninterrupted work at setting type in an over-heated, low-studded room, by an open window, averaging ten and frequently passing fourteen hours at his post, the patient was seized with muscular twitchings of the head and neck, the chin being jerked violently toward the *right* shoulder and oscillating between that point and the median line, where it was impossible to keep it.

Large doses of morphia hypodermically produced temporary relief, but in Jan. 1880, he was seized again, the head this time "veering gently but firmly to the *left* and remaining there persistently." Worked for eight weeks wearing a strap, the symptoms increasing in severity until, at their maximum, the head twitched violently from side to side at the rate of forty oscillation a minute for sixteen hours. Had recourse again to subcutaneous injections of morphia, began to improve about the 1st of May, and the 10th of June resumed work, feeling freer from all symptoms than at any time since the first attack. This immunity, however, was of short duration. In three weeks he was seized suddenly again, and from that time (July 4, 1880) until now he has never been entirely free.

The galvanic current was applied daily to the right sterno-mastoid with slight relief in severity of spasms at the end of six weeks.

Intramuscular injection of the sulphate of atropia in doses of one-sixtieth of a grain, and of curare one-third of a grain, the application of cantharidal collodion and of the tincture of calabar bean to the affected muscles, and ice to the spine, were all tried in turn without effect, except in the case of calabar bean which produced temporary relief for an hour or two after application.

The question of cutting down upon and stretching the spinal accessory nerve at its point of distribution to the affected muscles was entertained, but deemed inadvisable till milder measures should have failed.

At the suggestion of Dr. A. T. Cabot it was resolved to try the effect of fixation in a plaster bandage in the manner described by Delore in the *Gazette Hebdomadaire* for March 22, 1878. The good effect of this apparatus in tonic spasm of the muscles of the neck encouraged the hope that it would be equally efficacious in controlling the clonic spasms of our patient.

The head was accordingly held with the chin pointed somewhat away from the side towards which it tended to be drawn, and the head and shoulders were then enveloped in a plaster bandage.

No inconvenience was experienced from wearing the casque after the first few days. On the contrary, the patient expressed intense relief from the total cessation of the muscular twitchings which were now rendered impossible. This apparatus was worn for eight weeks, the patient resuming his work at long hours without experiencing any return of his trouble.

On removing the casque at the end of eight weeks the muscles were found to have lost their rigidity and to have regained their normal softness. For seven days there was no return of the spasms, and the patient was able to maintain the chin in the median line or turn it to either side without any effort or pain. At the end of a week there appeared slight symptoms of returning trouble, and at his request a second casque of plaster of Paris was applied.—*Bost. Med. and Surg. Journ.*, April 27, 1880.

Retro-Pharyngeal Goitre.

Dr. O. CHIARI reports in the *Monatsch. f. Ohrenheil.*, No. 11, 1881, two recent cases of this character. After having established the diagnosis with the aid of numerous exploratory punctures, he made up his mind to remove the tumour; the patient, however, died of pyæmia, consecutive to an abscess caused by the punctures before the operation could be performed.

In the second case, that of a young man sixteen years of age, there was a soft tumour situated in the posterior wall of the pharynx, and which showed no improvement under various methods of treatment. It was readily determined that the tumour was connected with the right lobe of the thyroid gland.

In an analogous case, seen four years previously, puncture had been followed by only a few drops of blood. Both lobes of the thyroid were greatly hypertrophied; they continued to do well under iodine treatment alone.—*Rev. Mens. de Laryngol.*, March 1, 1882.

The Prognostic Value of a Sub-Clavicular Tympanitic Percussion Sound.

From a careful study of the bearing of this physical sign on the prognosis of pleuritic effusions, Dr. J. GRANCHER draws the following conclusions: He believes that more can be learned as to the probable progress of an exudative pleurisy by the study of the apex of the lung than by the portion covered by the effusion. He believes that when a tympanitic percussion note is found in the sub-clavicular region, coincident with an increase of vocal fremitus and respiratory vigour, the upper lobe is in a perfectly healthy condition, and is supplementing by increased action the loss of respiratory surface below. When the tympanitic note is accompanied by increased vocal fremitus but abnormally feeble respiration in the apex, it indicates that the upper lobes are the seat of a congestion, whose nature can only be determined by the subsequent progress of the case. When the tympanitic sound is associated with decreased vocal fremitus and respiration, Dr. Grancher believes that ordinarily it will be found that the bronchi are compressed and the apex œdematous.—*L'Union Méd.*, April 1, 1882.

Treatment of Special Cases of Empyema by Thoracentesis and Simultaneous Injection of Purified Air.

MR. R. W. PARKER read a paper with this title at the meeting of the Royal Medical and Chirurgical Society on April 25th. The author commenced his paper with the record of a case of empyema in a child aged three years and three-quarters, who had been in the East London Children's Hospital under the care of his colleague, Dr. H. Donkin. The physical signs pointed with great clearness to a very large effusion, but on attempting aspiration only four ounces could be withdrawn. A few days later a further attempt was made, with no better result, although the chest wall was punctured in two or three places. Finally a free incision was made, when between forty and fifty ounces of fluid were got out. The child ultimately recovered with hardly any deformity, although she had an attack of smallpox while the empyema was still discharging. The mechanism of tapping was then referred to. He reminded the Society that it was *vis a tergo* which expelled the fluid rather than a *vis a fronte* which sucked it out. Either the lung re-expanded, or the diaphragm rose, or the chest wall fell in. There were cases, however, in which, owing to rigidity of the chest walls and binding down of the lung, this expulsive force was reduced to a minimum, and additional means became necessary in order to empty the abscess cavity. Dr. Bouchut, of Paris, had published a case similar to his own, and had proposed to forcibly expand the lung through a tube introduced into the bronchus. Instead of this somewhat heroic treatment, it was suggested that filtered and carbolized air should be introduced into the pleural cavity in order to displace the fluid. A suitable apparatus for this purpose was shown, and its mode of use demonstrated to the Fellows present. At the completion of the operation it was stated that the air in the empyema cavity ought to be somewhat less dense than the external air, so that the lung might be in a position to re-expand from the first, while the gradual absorption of the air would keep up that advantage during the period of cure. It was contended also that the presence of air in the chest, under such circumstances, by supporting the vessels would tend to hinder the reaccumulation of fluid which a condition of vacuum, as under ordinary circumstances, would rather tend to promote. A case, under the care of Sir Symes Thompson, in which this plan of treatment was successful, was referred to. Instances also were mentioned in which there had been difficulty in withdrawing the fluid, depending on other causes, and particular stress was laid on them, for in such cases the injection of air into the pleural cavity would not suffice to overcome the difficulty. The author especially emphasized that his "plan of treatment is adapted chiefly for those cases in which the difficulty of getting out the fluid depends on rigidity of the wall of the empyema cavity." This condition is most likely to occur in adults, although the case mentioned at the commencement of the paper was a typical one, occurring in a young child. He recommended its trial before "free incision, which is a somewhat severe measure," is adopted.

DR. SYMES THOMPSON said that in his patient's case, referred to by the author, the result of the plan, especially in freedom from the cough and discomfort, which often compel cessation of aspiration, was very satisfactory. He did not think the double opening necessary, and had recently adopted a device whereby air was admitted through the aspirator canula. The method, as stated, was applicable to cases of chronic effusion with rigid chest walls; but although it might be of service in serous effusion, free openings were probably necessary in purulent collections, because all experience points to the desirability of free drainage in such cases. Mr. Marshall had lately indicated an anterior opening

as the best site for puncture, that being the place selected by nature; but he (Dr. Thompson) thought a lateral position was more favourable for drainage. The ascent of the diaphragm interfered with free drainage in cases of opening in the posterior axillary line. As regards Mr. Parker's plan, the replacement of the fluid by purified air was an advantage; but it was open for discussion whether air or some fluid was the best medium.

Dr. DOUGLAS POWELL thought the idea ingenious, and said the case mentioned was one to which it was particularly adapted. The effusion was of old standing and the lung had been long bound down. In another case, under his own care, at Brompton Hospital, Mr. Hicks had performed an analogous operation. It was one where fluid had to be removed without altering the pressure within the chest, for it was complicated by a diseased and excavated lung; and it was feared that the mere removal of the fluid might induce rupture of the cavity. It was a question whether the replacing of fluid by air was not better done by making a free opening under the carbolic spray. In the first example given in the paper it was difficult to conceive that in a young child sixty-three ounces of pus should be retained in the chest during an attempted aspiration, unless the opening had become closed. He remembered the case of a lady where Mr. Arnott operated. It was a large empyema; and although a long bistoury was plunged up to the hilt, the fluid did not escape. It was quite a recent effusion, and its retention could hardly be explained on Mr. Parker's hypothesis. It was rather due to a loose layer of lymph lining the costal pleura, which may not have been incised and had blocked the opening. This seemed to be the case, since after a plug had been left in the wound a sudden evacuation of pus took place in the night, probably from the lymph becoming softened. The cases suitable for Mr. Parker's method were rare, being limited to those of rigid thorax and bound-down lung. In serous cases it was no advantage to remove all the fluid, the great object being to give rest to the lung, which was not obtained if all the fluid was removed; and it was doubtful whether replacing a pleura partially full of fluid, with carbolized air quite filling the pleura, was a gain. In purulent effusions the best method is to make at once a free incision. He advocated the employment of a manometer attached to the side tube, as giving information as to whether the canula were blocked, and whether the pressure in the chest were positive or negative.

Dr. REGINALD THOMPSON said that the cases related in the paper did not support the value of the author's suggestion. The first case was inapplicable; the crytometric tracing showing clearly that the empyema was pointing in front. In the case in which the plan was adopted only two ounces more fluid were evacuated than at the previous aspiration, and the measure required an additional opening. Nor did he think the third case supported the method.

Dr. COUPLAND considered the plan worthy of adoption in cases of chronic effusion in old subjects; and mentioned a case in point where a hemorrhagic effusion became purulent apparently in consequence of aspiration under these conditions, an issue which probably would not have occurred had pure air been injected to replace the fluid.

Dr. WARNER urged the special advantages of a double incision, as allowing of the free entrance into and exit of air from the pleural cavity. The lung remains at rest, and the process of granulation on the diseased surfaces takes place satisfactorily. In two cases so treated the lung had completely re-expanded. Mr. Parker's method was likely to be useful in some cases, but it did not give rest to the lung.

Mr. F. HICKS had introduced air into the chest on this plan in three cases. The first was one of chronic effusion of six weeks' duration. Three weeks after

operation fluid was still in the chest, and no further operation was necessary in that case. The second was one of acute empyema, in which air was introduced alternately with the extraction of fluid. No marked result ensued, and free incision was made later. The third was that referred to by Dr. Powell, in which air was introduced to prevent too rapid effusion in a case where the lung was much diseased. Air was introduced alternately with removal of the fluid until thirty or forty ounces had been withdrawn. It must be remembered that as soon as air is introduced into the pleura it is impossible to withdraw all the fluid unless the trocar be inserted at the lowest point. For that reason he had supplemented this method by a plan for washing out the sac at the same time and through the same opening. Air is absorbed somewhat rapidly, and in Dr. Powell's case rupture of the lung took place three or four days after the operation, and a fistulous pneumothorax formed. In this case the patient was in a low state, but after the formation of the fistulous pneumothorax an incision was made, and he lived some time after. The cause of failure in aspiration was not pushing the trocar in deeply enough at the first plunge. Mr. Hicks showed his modification of Mr. Parker's apparatus, which combined washing out with fluid and injecting air as well. Cough at the close of the operation was undoubtedly prevented by this method, but it might also be prevented by an elastic bandage round the chest.

The PRESIDENT could not understand how there could be such rigidity of the chest walls in a child as to prevent the outflow of fluid. Moreover, the pressure of the abdominal viscera and the expansion of the other lung would act in expelling the fluid even if the wall itself were rigid. It was assumed that air is absorbed slowly, but surgeons know how rapidly it could be absorbed. Therefore, the injection of fluid was equally safe; and some have suggested to replace the pus by oil. The old surgeons used to inject a decoction of barley. If air were injected the fluid could not be got rid of unless the opening were low, and air could be just as well, if not better, admitted by means of a free opening, which does not exert any force on the lung one way or another. Mr. Parker's plan was applicable to cases of rigid chest wall, but he would put the author on his guard against sources of fallacy.

Mr. PARKER, in reply, said he was aware that the method would be open to discussion and objection. The title of the paper was, "Suggestions for the Treatment of Special Cases of Empyema," and he had referred to cases in the paper in which there were other difficulties than rigid chest walls, for the purpose of showing that he was alive to some of these other difficulties. It was clear that the present methods of treating some cases were insufficient; for since the time when Dr. Symes Thompson had allowed him to operate on one of his cases, this new plan had been tried and elaborated at Brompton Hospital. He had suggested that this plan should be tried previous to free incision, in the hope of being able to avoid that necessity, but was well aware that free incision secured excellent results, though in some cases surgeons were quite unable to close the wound, owing to the non-collapse of the empyema cavity. In some cases of serous effusion the fluid re-collects rapidly; in such it might be preferable to substitute air for the fluid, and the conditions governing absorption would probably not be the same as in the healthy pleura. In the particular case related he had taken every precaution to avoid fallacy; he was possibly influenced by Bouchut's case referred to, and by the fact that a cavity in which the needle could be freely moved not infrequently remained on the cessation of the flow of fluid. If such were the case, there must be more or less of a vacuum—a condition most favourable to reaccumulation of fluid. Mr. Parker demonstrated his apparatus at the close of the meeting.—*Lancet*, April 29, 1882.

Primary Cancer of Lung.

At the meeting of the Pathological Society of London, held April 18, Dr. FENWICK showed a specimen of malignant disease of the right lung; he considered it to be a cancer, but as no sufficient microscopical examination had been made, this question remained doubtful, and was referred to the Morbid Growths Committee for settlement. He referred to the rarity of primary cancer of the lung, and gave some interesting statistics on this point. If the now generally accepted embryological classification of cancer be true, there is no difficulty in accounting for primary cancer in the lung, since cypilastic elements largely contribute to its formation. Undoubted cases of primary cancer have been recorded from time to time; though, compared with some other organs, the lungs are remarkably exempt from this form of disease, despite the varying and almost constant irritations to which they are subject. During the discussion, Mr. Butlin referred to the dissemination of cancer by the inhalation of cancerous particles from a diseased tongue. This view has frequently been advanced, but the grounds for accepting such a method of inoculation or grafting do not appear to us sufficient. It is well known that all attempts to engraft cancer even on animals predisposed to the disease, such as female dogs and cats, have hitherto failed; thus, while it would be premature to deny the possibility of such a mode of infection, it seems somewhat hazardous at present to trace a causal connection between lung and tongue cancer, such as the one just referred to, while there are other and more usual methods of accounting for its spread. Thus, the lymphatics about the tongue are numerous, and are early implicated in disease of this organ. The blood into which the lymph is poured at the root of the neck after passing through the heart next circulates in the lung, and hence it is not difficult to understand the frequency with which these organs are affected with secondary deposits. There are still many interesting points to settle as to the histogenesis of cancer. For while the embryological doctrine of its origin holds good in a large proportion of the cases, yet a growth resembling true cancer is occasionally found in structures which are derived from the middle embryonic layer. Embryologists, it is true, are not agreed as to the exact origin of some organs; they would do well to study these moot points in the light of the pathological degenerations to which such organs (as the ovary and testis for instance) are liable.—*Med. Times and Gaz.*, April 22, 1882.

Artificial Feeding in Phthisis.

At a meeting of the Paris Medical Society (*Gaz. des Hôpitaux*, April 18), Dr. DUJARDIN-BEAUMETZ referred again to this subject, of which we have already given an account in the *MEDICAL NEWS* for Jan. 14, 1882. In his present communication he corroborates all that has been stated by Dr. Debove of the great success which attends the feeding, by means of the œsophageal tube, of patients suffering from phthisis, and who can retain no food. Successful as his own trials of the plans were, Dr. Beaumetz did not find them come up to those obtained by Dr. Debove, and he found, on investigating the reason of this, that that physician did not content himself with giving eggs and raw meat, but had the meat reduced to an impalpable powder, which is very promptly absorbed. Since M. Beaumetz has followed the same plan he has obtained results as satisfactory as those of Dr. Debove, and he has extended this mode of alimentation to hysterical patients suffering from incoercible vomiting. Food thus injected was not vomited, and the same fact has been observed in the wards of Prof. Charcot. At the discussion which ensued, Dr. Debove stated that he had received in his wards the visits of many hospital physicians, who were able to verify for themselves that the

phthisical cases so treated had undergone notable amelioration. The patients had become fatter, and several of them had gained twelve kilogrammes in weight in two months. In most of them the night-sweats had ceased, and the cough had much diminished, so that they seemed to be in a condition approaching recovery. In one case in which death was due to an incidental cause, enormous cavities were found at the autopsy, which were covered with granulations of a healthy nature. To obtain such an extraordinary amelioration it is requisite that these patients should be got to take enormous quantities of nutriment, so as to recover lost ground; and for this purpose they have to be submitted to a kind of training. They will thus take three litres of milk, 600 grammes of raw meat, a dozen eggs, and some powder of lentils. One patient took for sixteen days three litres of milk and twenty-one eggs. In order to insure as complete a digestibility of aliment as possible, the object is to bring the food over a large extent of surface in contact with the digestive juices of the stomach; and with this view milk is the most favourable diet, eggs also, and especially raw eggs, being very useful. The improvement is heralded in especially by the absence of diarrhœa, and by the increase of urea, which in several patients increased from fifteen to twenty grammes to seventy grammes per diem. Dr. Debove chops up the raw meat, and having reduced it to an impalpable powder, introduces as much as 600 grammes at a time by means of the tube, this representing two kilos. of fresh meat—which is truly an enormous dose. But the absence of diarrhœa, the increase of weight, the considerable augmentation of the proportion of urea, and the reduction of fecal matters to their minimum, demonstrates forcibly that this regimen is successful. The meat-powder is, moreover, perfectly digestible. M. Joffroy inquired of M. Beaumetz whether the hysterical subjects he had so successfully treated were only in the first stage of hysterical anorexia, or whether any of them were at the second period, when it had lasted for eighteen months or two years, these being the truly difficult cases in which all treatment usually fails. Dr. Beaumetz replied that in his cases the vomiting had not lasted more than three or four months. In the advanced period we have also to do with inanition, so that patients will die of hunger; but this period must not be waited for before recourse is had to artificial feeding. The curious point is that these patients retain nothing that is taken by the mouth, and do not reject that which is administered by the sound. M. Troisième mentioned the case of an hysterical subject convalescent from typhoid fever, who ceased vomiting after being fed by the tube; and the paroxysms of coughing brought on by the introduction of this did not induce vomiting, although, before, the slightest cough caused it.—*Med. Times and Gaz.*, May 6, 1882.

Syphilitic Disease of the Heart.

In most of the cases of syphilitic heart disease on record, death has occurred suddenly, and the nature of the disease has only been revealed at the necropsy. The following case, therefore, lately reported by Dr. MANNINO in the *Giornale Italiano delle Malattie Veneree e della Pelle*, is of interest, from the fact that the diagnosis was made during life and verified after death. The chief points of the case are briefly as follows:—

A man, aged 36, was admitted into the hospital at Palermo, under the care of Dr. Federici, and stated that he had always had good health, until eight years before, when he contracted some venereal disease, which was followed by pains all over the body. These pains were relieved by iodide of potassium. Since that time, however, he had suffered every winter from an eruption on the lower limbs, and for a few months previous to admission he had had occasional attacks

of dyspnœa. These attacks had become worse during the last few weeks; a troublesome cough also added to his distress; and he gradually became too ill to continue his occupation. On admission, the patient was very weak, and complained of difficulty of breathing. Cough was frequent, sometimes dry, and sometimes attended by expectoration. The belly was swollen; both lower extremities were œdematous, and covered with coppery stains, pustules and scaly patches, some being ulcerated. There was also enlargement of several groups of lymphatic glands. The cheeks, lips, and tip of the nose were blue; the great veins of the neck were prominent and turgid, while arterial pulsation was very weak. The skin of the trunk and neck was mottled, and the radial pulse imperceptible. The hands were cold. The heart's impulse was diffused, and the exact situation of the apex-beat could not be defined. The pulsation was visible also in the epigastrium to the left of the sternal line. The area of cardiac dullness was not increased, the lowest limit being the fifth intercostal space. At the apex, the first sound was obscure, and accompanied by a very weak blowing murmur. At the base and at the second right intercostal space, the *bruit* was somewhat louder, and the second sound weak, but clear; but the *bruit* was much more distinct at the epigastrium than in any other situation. The percussion sound was normal over the anterior part of the chest; but the posterior thoracic parietes were œdematous. Slight mucous *râles* were audible in places; elsewhere, the respiratory murmur was normal. The area of hepatic and splenic dullness was somewhat increased. The urine was scanty, acid, specific gravity 1025, and contained traces of albumen.

From these various symptoms, Dr. Federici diagnosed—first, that the right side of the heart was chiefly at fault, because the *bruit* was more distinct at the base and towards the right than at the apex, and still more distinct in the epigastrium; secondly, that the disease was not in the valves, but in the muscular structure of the heart, because of the rarity of primary disease of the right side of the heart, the normal area of dullness, and the peculiar and very feeble way in which the heart contracted, together with the great increase of tension in the venous system and the emptiness of the arteries. Lastly, he diagnosed syphilitic disease, from the presence of the syphilitic rash, etc. Hypodermic injections of mercury and large doses of iodide of potassium were prescribed. Soon after admission, the attacks of dyspnœa became gradually more and more severe, especially during the night; but the patient slept pretty well in a semi-erect position. The pulse was regular, but never perceptible at the wrist, and even in the larger arteries—the femoral, for example—was very weak indeed. The temperature was usually below normal. The *bruit* became fainter, but was always heard best at the epigastrium. The sputa became bloody, the dyspnœa more and more urgent; and, finally, death occurred somewhat suddenly, after a meal, nine days after the patient's admission into hospital.

Post mortem, the pericardium contained about three ounces of clear serum. The heart was globular in form, and weighed 393 grammes (nearly 14 ounces); the enlargement being due more to the left than to the right ventricle. On the anterior surface of the right ventricle was a large whitish patch of fibrous induration, eight centimetres long and three centimetres wide. On the left ventricle was a similar patch, of the size of a five-franc piece; and other smaller patches were scattered on the surface. A hard fibrous cord, studded with nodules, followed the direction of the interventricular septum. These parts resisted the knife, were pale in colour, and creaked on section. The tricuspid valve was healthy, except a slight swelling on one of the cusps. The endocardium was opaque in patches. The left ventricle was considerably dilated. The mitral valve was healthy. The endocardium of the conus arteriosus was white, indu-

rated, and shining, like cartilage. The muscoli papillares of both ventricles were pale and shrunken. Under the microscope, the affected portions of the muscular substance showed the usual appearances of syphilitic myositis. The lungs were adherent in places, partly emphysematous, and contained numerous infarcts. The liver showed a patch of syphilitic interstitial hepatitis in an early stage. The spleen was rather hard and large, and its capsule opaque, and adherent in parts to the thoracic wall. The kidneys were highly congested. The other organs of the body, as well as the large bloodvessels, were normal.—*Brit. Med. Journal*, April 15, 1882.

Fistulous Communications between the Gastro-intestinal Canal and the Chest.

Dr. H. TILLMANNS reports, in von Langenbeck's *Archiv*, Band xxvii., Heft 1, a case observed by himself and Dr. Neubert of Leipsic, of fistulous communication between the intestinal canal and right pleural cavity. The patient was a lad aged 15, who, on the morning of June 9, 1880, was seized just below his arms by a friend and swung forwards and backwards in sport. After his dinner he vomited twice, and during the following night was taken with acute pain in the right hypochondrium. This pain persisted and increased in severity, and the patient was compelled to lay up. On the ninth day, and after the tenderness in the region of the liver had been slightly relieved, signs of effusion on the right side of the chest were presented. On the fourteenth day, he was suddenly attacked with intense pain over the whole of the right side of the chest, and with increased tenderness in the abdomen. Dulness on percussion was made out over the whole of the right lung, except in the second, third, and fourth intercostal spaces near the sternum, where there was a well-marked tympanitic sound. At the same time the patient suffered much from dyspnoea, and presented symptoms of collapse. He was also very feverish. The space between the fifth and sixth ribs on the right side having been punctured, about a pint of thin greenish purulent fluid, with a decided faecal odour, was withdrawn by aspiration. This exudation was mixed with fluid intestinal contents and with bile. On the sixteenth day, a free opening was made in the wall of the chest, and the purulent cavity was washed out with a solution of salicylic acid and drained. The external opening was covered by antiseptic dressings; and, during a period of four days after the second operation, the right side of the chest was washed out twice daily by a solution of permanganate of potash. Subsequently, and when the strength of the patient had improved, carbolic acid was substituted for the permanganate in the injections. The discharge, which, until the middle of August, occasionally had a faecal odour, and presented minute fragments of food, diminished steadily, save with one relapse after premature removal of the drainage-tube on August 14, and, at the end of the fifth month, had altogether ceased. After an interval of six months from the date of the injury, the patient was quite well.

In his comments on this case, Dr. Tillmanns states that, from what he has been able to make out from a study of the literature of pathological communications between the abdominal and thoracic cavities, the formation of a fistula leading into the chest from any part of the intestinal canal is a very rare occurrence. Communications are much more frequently established between the upper portions of the digestive tract—the œsophagus and stomach, and the thoracic cavity. The best known example of such is a cancerous perforation of the œsophagus involving the pleura. Gastro-thoracic fistula is occasionally formed in cases of ulcer of the stomach, and of diaphragmatic hernia. Of much more frequent occurrence are cases of perforation of the diaphragm, by purulent collections formed in the liver or some other solid abdominal viscus.

The symptoms observed in this case soon after the receipt of injury and the occasional presence in the discharge of half-digested food indicated, in the opinion of Dr. Tillmanns, a rupture of the duodenum near its junction with the jejunum, and the attachment of the band of smooth muscular fibres known as Treitz's muscle. It is thought that the patient might probably have had ulceration of the duodenum, an affection which often runs a latent course until a sudden termination in fatal perforation. In consequence of this supposed perforation of the duodenum, suppuration, it is thought, had been established, the fæcal abscess having been either shut off from the abdominal cavity by inflammatory adhesions, or having, from its origin, been extraperitoneal. The pus might have passed along the yielding connective tissue or along the posterior abdominal wall, and finally have penetrated through the diaphragm, and set up fæcal pyo-pneumothorax in the right pleural cavity. Though regarding this as the most probable explanation of his case, Dr. Tillmanns would not altogether reject the theory of its origin in gangrenous diaphragmatic hernia, and in perforation of a small loop of intestine tightly constricted by the margins of a small orifice in the muscle. It is pointed out, however, that this view is opposed by the facts of the spontaneous closing of the fistula soon after thoracotomy, and of the complete recovery of the patient. In considering the probable course of the fæcal abscess from the abdominal to the thoracic cavity, Dr. Tillmanns insists on the clinical importance of the interspaces free from muscular structure, which have been described by Henle as existing between the costal and vertebral origins of the diaphragm. These interspaces, occupied merely by opposed layers of peritoneum and pleura, are of importance with regard to the condition of diaphragmatic hernia, of subphrenic, hepatic, and renal abscesses invading the chest, and of large hyatid and other tumours in the upper part of the abdomen.

Dr. Tillmanns has collected twenty-two cases of fistulous communication between the chest and the intestinal canal. In fourteen of these cases, the fistula led from some part of the large intestine (vermiform appendix, ascending colon, hepatic flexure of colon, transverse colon), and in the remaining eight cases from the small intestine. In three cases, fistulæ leading from the duodenum had opened through the posterior wall of the chest, without having perforated the pleura. The most frequent cause of the fistulous communication, according to these collected cases, is perforating ulcer of intestine (fourteen out of the twenty-two cases). In five cases, the fistula was the result either of traumatic suppuration, or of gangrenous diaphragmatic hernia caused through injury. In one case, the communication between the chest and intestinal canal originated in a pulmonary abscess caused by the presence in a lung of a foreign body. In the cases in which the fistula resulted from perforating ulcer of the intestine, the vermiform appendix was the original seat of the disease in six instances, the hepatic flexure of the colon in two, and the duodenum in five. In three cases the fistula communicated with one lung, and in three other cases it passed between the pleura and the thoracic wall. In every case of perforating intestinal ulcer, the fistula was on the right side of the chest; of the eight cases of fæcal fistula that had originated in gastric ulcer, in injury, in action of foreign bodies, or diaphragmatic hernia, in five the fistula was on the left, and in three on the right side.

In some remarks on the treatment of thoracic fæcal fistulæ, Dr. Tillmanns states, that it is proved by his case, that this condition may be cured by thoracotomy and drainage of the cavity in the chest, and that spontaneous closing of the intestinal perforation may follow evacuation of an intrapleural and probably also of a subphrenic fæcal abscess. It is suggested, that resection of the perforated portion of intestine might be justifiably resorted to in cases of fæcal abscess with persistent intestinal communication. It is well known that good results have

been attained from antiseptic resection of the affected portion of intestine, in cases of false anus and of gangrenous hernia. Equally valid indications for such treatment might be presented in certain cases of thoracic fæcal fistula, and of sub-phrenic fæcal abscess. In many cases, also, of perforation of the œsophagus and stomach, cure might possibly be brought about in a similar manner, with or without stitching together of the divided organ, if it were possible to drain effectually the abscess caused by such perforation. Again, in recent cases of perforation at some portion of the gastro-intestinal canal, success might attend very early laparotomy and stitching of the perforated gut or stomach. The result of this treatment in such a condition would depend mainly on the points whether, and if so, to what extent, the contents of the digestive canal had been poured out into the peritoneal sac, and whether the consequent peritonitis were diffused or circumscribed.—*London Med. Rév.*, March 15, 1882.

Vomiting of Urine.

MM. GENERALI and TONINI (*Chron. Med. Quir. de la Habana*, Dec. 1881) report the unique case of a syphilitic woman of 33 years of age, who recovered from an attack of double pneumonia, lasting ten days. This was succeeded by an acute peritonitis with serous effusions. Up to this time the urinary secretion had been normal, but it was now suddenly reduced to 500 grammes, and steadily diminished in quantity until there was complete suppression. The patient then commenced to vomit a fluid which resembled urine in all its physical characteristics, and on micro-chemical analysis it was found to contain all the constituents of the urine: urea, phosphates, chlorides, alkaline and earthy sulphates, carbonate and phosphate of magnesia, and large quantities of pigment. The microscope revealed the presence of epithelial cells of the œsophagus and stomach, and mucus and crystals of the uric acid type, which formed spontaneously by the decomposition of the urate of soda in the presence of the acids of the stomach. As long as the vomiting lasted, not a drop of urine was to be found in the bladder. In about a month the patient was completely cured.—*Journ. de Méd. de Paris*, Feb. 4, 1882.

An Obscure Case of Duodenal Ulcer.

Dr. E. B. GRAY reports the following case: J. J., aged fifty-eight, a retired college servant, between 5 and 6 P. M. on Sept. 24th suddenly vomited a large quantity of blood. On my arrival about a quarter of an hour afterwards, I found he had brought up by measure over twenty ounces of bright red blood. He was ordered twenty minims of tincture of perchloride of iron every three hours, to keep to ice and iced water, and to remain absolutely at rest on his back.

He was a very well-nourished man, and of healthy appearance. I could find no evidence of disease of heart, liver, or kidneys. The appetite was normal; epigastrium only slightly tender to pressure. The only history was that for two years previously he had had pain "across the pit of the stomach and through to the loins," seldom absent for many days at a time, and for the last month or so getting worse, but never accompanied by vomiting. He was very doubtful whether it had been at all influenced by what he ate. He had never passed blood by the bowel; he had not been losing flesh. No further hemorrhage occurred that day, and at 10 P. M. he seemed very comfortable. Soon after midnight the bowels became uneasy, and in the course of the next four hours he passed by the bowel between a pint and a half and two pints of dark clotted blood.

Sept. 25. Very blanched and prostrate, but no further loss of blood. Slept
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much during the day, swallowing nothing but ice, iced beef-tea, and the perchloride of iron.

26th. Remained undisturbed until 3 A. M., when he was seized with violent epigastric pain, fainted, and died in a few minutes.

At the post-mortem examination the stomach and intestines were found full of blood. The sole lesion discoverable was a small deep ulcer, of the diameter of a split pea, clean-punched out of the otherwise healthy mucous membrane of the duodenum. At the bottom of the ulcer was a small perforation in the pancreaticoduodenal artery. The other abdominal organs were healthy. The chest could not be examined.

This case illustrates well the occasional extreme difficulty of diagnosing duodenal ulcer. Chronic complaints of pain at the pit of his stomach, with scarce any tenderness, along with ability to take food and maintenance of his bodily nutrition and appearance of health, had gained for this unfortunate man the reputation of a confirmed hypochondriac, and at one time of a malingerer. But duodenal ulcer may run a fatal course with even greater latency of symptoms than occurred in this case. In the *Transactions of the Pathological Society*, vol. ix., the late Dr. Murchison records a case of a finely developed man who died suddenly of peritonitis from a perforated ulcer of the duodenum, and who up to the time of his fatal attack had enjoyed excellent health, and never suffered from vomiting or any pain whatever after food or at other times.—*Lancet*, May 13, 1882.

Localization of Intestinal Catarrh.

Inflammation of the mucous membrane of the bowel—intestinal catarrh, as it is now customary to term it, irrespective of its cause—may be of very limited distribution. It is true that this statement has been contested by some authorities, notably by WOODWARD, on the ground that specimens of such localized affection are rarely to be found in pathological collections. But inflammation of less severity is naturally of less extent than that which brings its subject to the post-mortem table, and the frequent clinical evidence of localized enteritis is fully confirmed by the systematic examination of the bowel in cases in which the intestinal affection merely complicates other diseases. Our knowledge of the variations in symptoms which attend these changes in locality is, however, still vague and scanty. By the occurrence of jaundice we recognize that the duodenum suffers; tenesmus points to the rectum; while by the position of pain and tenderness we may often guess with more or less accuracy at the part of the intestine which is chiefly diseased, but we know little or nothing of the influence of locality on other symptoms which attend inflammation of the bowel. To supply facts to bridge over this lacuna in medical science has been the object of some observations, continued with characteristic industry for a considerable time, by Professor NOTHNAGEL, of Jena, in which symptoms and pathological appearances were most carefully compared, and the extent of which may be judged from the fact that a microscopical examination was made of more than one thousand evacuations. The results have been published in the *Zeitschrift für Klin. Medicin*.

The first question which he has studied is the indication to be drawn from the character of the stools. The significance of the passage of pure mucus, as indicative of an affection of the sigmoid flexure, is well established. Scybala imbedded in mucus may, it is currently said, be due to an affection of any part of the colon, but Nothnagel asserts that this condition of stool is only met with when this disease is below the splenic flexure, and it is certainly indicative of a catarrhal condition. The same conclusion cannot, however, be drawn from the passage of large well-formed stools surrounded by a layer of mucus. The latter indicates a condi-

tion in which catarrh may easily arise, but not an actual inflammation. The absence of mucus does not exclude the absence of catarrh of the lowest part of the bowel, as several well-authenticated cases show. Mucus may, moreover, be passed in abundance, when ordinary examination of stools does not suggest its presence. In this state the stools are soft (not liquid) and apparently uniform, but a thin layer, between plates of glass, presents, under the microscope, numerous clear islets of pure mucus. This condition is of considerable importance in regard to localization, and indicates catarrh of the small intestine, with or without implication of the ascending portion of the colon. With such evacuations the lower half of the colon is always healthy. If the latter is affected, the mucus is found not only in the substance of the feces, but also on their surface. In some cases of catarrh of the whole of the large intestine, the stools are of a pulpy, almost fluid consistence, and contain small globules of mucus, but these are so large as to be visible to the naked eye. The microscopic globules come only from the small intestines. On the other hand, the former cases are distinguished from catarrh limited to the lowest part of the colon by the intimate mixture of the mucus and fecal matter. Of course, this conclusion does not hold good for the cases of severe dysenteric inflammation of the whole colon, in which pure mucus is evacuated, or in which, in consequence of the damage to the membrane, mucus is no longer secreted. There is yet another form in which mucus is passed which is of diagnostic significance—globules of mucus coloured yellow by bile pigment. These are never found in catarrh which is limited to the colon; the small intestine is usually, and often chiefly, involved. The appearance is not infrequent in typhoid fever.

Another constituent of the feces which is of diagnostic importance is bile pigment. It is well known that under normal conditions the contents of the bowel cease to react, in a characteristic manner, to Gmelin's test, at or about the ileo-cæcal valve. The play of colours no longer commences with a conspicuous green. A characteristic reaction in the feces, or at least in certain of their constituents, indicates that there is an augmented peristalsis of the colon and lower part of the ileum. Nothnagel has never been able to obtain this reaction in the general mass of a consistent stool. If unaltered bile pigment is present, the consistence of the feces is always more or less liquid. A retention in the colon sufficiently long to give firmness is always attended with a transformation of the pigment. It is rare, under any circumstances, for the reaction to be obtained from the whole of the fecal mass, except in acute infantile enteritis. Much more frequently the unaltered bile pigment is found only in portions which contain much mucus. Sometimes the same evacuation contains both clear and yellow-stained mucus, the latter giving the bile reaction and coming from the small intestine, the former from the colon. The presence of the former was invariably found, post mortem, to be associated with catarrh of the jejunum and ileum. It implies an increased peristaltic action, which must, however, involve not only the small intestine, but also the colon throughout its entire length. If the greater part of the large intestine is healthy and the stools infrequent, no unaltered bile pigment may be passed, in spite of the existence of catarrh in the lower bowel. Micro-chemical investigation often shows that not only mucus but cylindrical epithelium contains unaltered bile pigment. The diagnostic significance of this epithelium is the same as that of the bile-stained mucus. The staining of the epithelium may be proved, post mortem, to occur in the small intestine, but only after detachment from the mucous membrane, since that which is still *in situ* is always colourless. Rarely, leucocyte-like corpuscles and fat globules, stained with unchanged bile pigment, may be found in the stools, and have the same significance as the epithelium.

The presence of unaltered fragments of food in the feces constitutes another

element of diagnostic significance, since their quantity indicates normal variations in different parts of the intestinal canal, being far greater in the small than in the large bowel. Fragments of muscular fibre are invariably present under normal conditions, and hence only a considerable excess can be regarded as pathological. The significance of this constituent relates only to the small intestine, for the colon has no influence on its presence. Whatever passes the ileo-cæcal valve is ejected without further change. A series of careful observations has shown that the digestion of muscular fibres is greatly hindered by pyrexia; that, in the presence of fever, an excess in the stools affords no diagnostic indication. Mere increased peristalsis, without fever or catarrh, is also capable of causing the excess; and if the motion of the contents of the intestine is not accelerated, intestinal catarrh does not increase the amount evacuated, and an excess therefore only points to such catarrh when other indications of this, such as mucus, are present at the same time. An excess of starch granules has a similar significance. Intestinal catarrh seems also to be without material influence on the amount of fat in the feces. The anatomical changes induced in the mucous membrane are absolutely without influence on the absorption of fat.

The conclusion of most previous writers, that physical examination of the abdomen furnishes but scanty indications for the localization of enteric catarrh, is confirmed by Nothnagel. An extensive series of auscultatory observations were made, the relative loudness of gurgling sounds in different parts of the abdomen being noted simultaneously by two observers, but the ready conduction of the sounds from one part of the abdomen to the other made definite localization impossible. Only when the noise was produced in the ascending or descending colon, and the small intestine contained liquid, was it inaudible on the other side. Nor does percussion teach much regarding the localization of intestinal catarrh, since the condition which usually obtains—less resonance in the central part of the abdomen than in the position of the colon—is also present in normal conditions. Even the alteration in the normal relative resonance of the two iliac fossæ, so frequent, as Traube showed, in typhoid fever, is produced by many conditions, and is of little diagnostic value. The study of the indication afforded by palpation confirms, but does not extend, the well-known significance of local tenderness and of local gurgling perceptible to the touch.

The last diagnostic point investigated by Nothnagel is the excretion of indican by the urine, which, as is well known, is increased in a remarkable manner in many affections of the gastro-intestinal canal. Unfortunately the extensive observations, including two thousand separate estimations of indican in the urine, of cases which were carefully watched, have yielded but little result. An increase was found in the majority of cases of intestinal catarrh and diarrhœa, and very often also in cases in which there was no intestinal affection at all. When the colon only was affected, however, no excess of indican was observed so long as the general condition of the patient was good. On the other hand, in all cases in which there was a decided catarrh of the small intestine, the indican was increased. So constantly was this found that Nothnagel was inclined to believe that the absence of an excess of indican gives ground for excluding catarrh of the small intestine, but his conclusion was rendered doubtful by a series of cases of exanthematic typhus, with severe intestinal catarrh, in which no indican was found in the urine. It may be doubted whether his previous conclusion is altogether invalidated by this fact; it may still hold good for the simpler forms of enteritis.

These laborious investigations, in a department of practical medicine often passed over as alike unpromising and uninviting, deserve the highest praise. They add materially to our knowledge of enteric symptomatology, and they show

how important are the facts which may be ascertained by a systematic study of the night-stool, and which has been too little regarded by the present generation of clinical observers.—*Lancet*, March 4, 1882.

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Jaundice in the Newly-born.

The mysterious jaundice which so often affects newly-born children has always given rise to much interest and many hypotheses, based for the most part on fancy rather than on fact. By some authorities its cause is referred to the liver, by others to the blood. Modern theories of jaundice render the former explanation the more probable, since the opinion that the elements of the bile are preformed in the blood has been practically given up, and with it falls to the ground the theory of "jaundice by suppression." Virchow believed that icterus neonatorum was merely a variety of the common catarrhal jaundice, and arose from duodenal catarrh, while Cohnheim has assumed that the bile formation of fœtal life is small, and is so suddenly increased at birth that the bile-ducts are not at first competent to carry the secretion away. Neither of these assumptions rests on any evidence. Another group of theories ascribes the jaundice to the disturbance of the circulation in the liver which occurs at the change from intra-uterine to separate life. Hewitt and Weber believe that the distended veins compress the bile-ducts, while Frerichs has adopted an older theory of Morgagni, and suggests that the sudden diminution in the supply of blood to the organ leads to a passage of the secreted bile into the bloodvessels. The theory of Breschet, that the jaundice depends on changes in the colouring matter of the blood, and is thus hæmatogenic in nature, has been recently revived by Epstein, but it rests on considerations which are, with one exception presently to be mentioned, even more purely hypothetical, and its chief support is the feeble argument that other causes have not yet been demonstrated.

This lacuna in our knowledge of the subject is to some extent filled up by facts which BIRCH-HIRSCHFELD, of Dresden, has supplied in an article contained in a recent number of Virchow's *Archiv*. It is, he points out, very difficult to avoid associating the jaundice in some way with the disturbance of the hepatic circulation on the transfer of its chief blood-supply from the umbilical vein, especially when regard is had to the conspicuous congestion and œdema of the liver, well described by Weber, which occur in cases in which the circulation through the umbilical cord is interrupted before the respiratory movements, by their effect on the right heart, afford an adequate compensation. It is to the connecting link between the two phenomena that Birch-Hirschfeld's attention has been specially directed. He notes that the vessels in the hilus of the liver are surrounded by a dense layer of connective-tissue, which is continued into the organ along the branches of the portal vein, and that in cases in which there is venous obstruction in the liver, in consequence of hindered birth, this tissue is the seat of conspicuous œdema. A broad layer of gray pulpy tissue incloses the vessels, and is seen also around the umbilical vein in its diaphragmatic portion, and may also extend to the gall-bladder. The microscopical appearances of this tissue are those of œdema with a more or less abundant accumulation of round cells in the interstices of the tissue. That this swelling of the tissue must compress the bile-ducts is sufficiently obvious; and Birch-Hirschfeld has found that not only, under these circumstances, are the bile-ducts distended, but there may be a positive difficulty in squeezing the bile out of the gall-bladder into the duodenum, and in the latter there is a manifest deficiency of bile. In such cases, in which death occurs during the first day of life, commencing icterus may be distinctly detected; and the gradual increase of the jaundice in connection with this pathological con-

dition may be observed in patients in whom life continues longer, as cases reported by Birch-Hirschfeld demonstrate.

A difficulty, however, in accepting this theory is presented by the fact, which has been relied on by the advocates of the hæmatogenic origin of the jaundice, that the presence of bile-pigment can rarely be demonstrated in the urine. The cause for this is not very clear. Its significance is, however, lessened, if not removed, by an important fact ascertained by Birch-Hirschfeld—that in fatal cases of this infantile jaundice the presence of bile acids may always be demonstrated in the pericardial fluid, whereas they cannot be found in other children who do not present jaundice. This may be taken as proof that the colour depends on the presence of bile in the blood, and not on any mere destruction of blood-corpuscles and transformation of the blood-pigment; it may also be regarded as proof of the hepatogenic origin of the jaundice. By the definite theory of Birch-Hirschfeld all the characters, peculiarities, and date of this form of jaundice may be perfectly explained.

In very rare cases, however, jaundice of much graver type occurs in newly-born children. One cause of this is a congenital atresia of the bile-ducts; more frequently it is due to the compression of the ducts by syphilitic inflammation and growth—the syphilitic peripylephlebitis of Schuppel. Another form, which is extremely grave, seems to be developed by an infective process. The *materies morbi* enters by the navel wound, and is perhaps the same as causes puerperal fever in the mother, conveyed, it may be, by bacteria, since two forms of micro-organisms may be found in the blood of infants in this condition—spherical and small rod-shaped bacteria,—the latter probably identical with those proved by Koch to be associated with the septicæmia of the mouse. Further investigations are necessary to ascertain whether these correspond to two different forms of infection. Birch-Hirschfeld's observations, however, tend to show that the rod-shaped bacteria occur especially in the form in which the disease develops rapidly, as a virulent general infection, with a strong disposition to hemorrhage.

In these cases an arteritis umbilicalis has generally been found, and the conclusion has been drawn that this vessel is the channel of infection. Of sixty cases, phlebitis umbilicalis was found in eleven, simple thrombus in the vein in four, arteritis alone in thirty-two cases, and inflammation of both vessels in three. Nevertheless, even when the artery alone is conspicuously diseased, the liver as a rule shows intense alterations, inflammatory changes in the periportal and inter-acinose tissue, and acute degeneration of the liver-cells, which constitute strong reason for believing that the infection reaches the liver by the umbilical vein. After birth the varying pressure on the liver vessels, due to the cardiac and respiratory movements, causes an alternate emptying and filling of the remnant of the umbilical vein whenever the contraction of the artery arrests the circulation within it. Hence the conditions are most favourable in the artery for the local development of the morbid process, but in the vein for the systemic infection, and the movement of the blood in the latter may explain why the local changes in it are less intense. Birch-Hirschfeld describes three cases in which there was a central phlebitis of the umbilical vein and a pylephlebitis had developed at the opening of the umbilical into the portal vein, whereas the whole lower end of the former was free—a condition which can only be explained by assuming that the movement of blood in the vein carried the infectious material forwards, so that its action was exerted chiefly on the portal vessels. This condition may easily escape notice in an ordinary examination. No relation is to be traced between the intensity of the vascular change and the degree of the jaundice which is so constantly associated with this infection, but the former is always intense when the changes in the substance of the liver are well marked;

thus it seems likely that this jaundice also is of hepatogenic origin, and it is probably due, like the benign form, to the swelling of the periportal connective-tissue compressing the bile-ducts within the liver itself. We can thus understand that the degree of jaundice should lessen towards the close in cases of severe general infection. The conditions which favour the occurrence of the benign form of jaundice, premature birth, weak breathing, etc., also favour the development of the malignant variety if there exist any cause of septic infection.—*Lancet*, March 25, 1882.

A Case of Chyluria treated with Benzoic Acid.

Dr. G. C. ROY reports the following case: A Mahometan female, aged twenty-four years, mother of two children, the last one being fourteen months old, applied to the Sooree Charitable Dispensary for treatment on the 29th of January, 1882, for milky urine. She noticed twenty days before that the urine on voiding coagulated into a jelly-like mass. This used to take place at night, but in the day it used to be clear and transparent. At times it would coagulate in the bladder and cause difficulty in micturition. She had a pale, emaciated look, and was subject to intermittent fever. Her appetite was craving; bowels regular. Beyond a feeling of uneasiness in the loins, she had no pain to complain of. There was no history of syphilis.

The urine brought for examination was passed at night. It had a turbid look, and had coagulated into a uniform jelly with slight tinge of red from the admixture of blood, and was here and there dotted with small red coagula. On microscopic examination there were found red blood-corpuscles crenated and shrivelled and crystals of triple phosphate entangled in a fibrillated mass. There was no filaria, but one broken specimen the identity of which was doubtful.

Ordered. Benzoic acid, grs. x *t. d.*

January 31. After taking nine doses of medicine, the character of the urine entirely changed. It was clear, of pale straw colour, and natural.

February 2. To-day the urine was somewhat red from admixture of blood, but there was no tendency to coagulation.

Continue medicine.

4th. The urine more bloody. The morning specimen was still of a paler colour, with slight sediment. In fact, the urine had more the appearance of hæmaturia than chyluria.

Omit benzoic acid. *Tr. ferri muriat.* ℥xx; *inf. calumbæ*, ℥j *t. d.*

7th. No change for the better. The urine was of rosy hue, and this morning had coagulated into a jelly as before.

No hæmatozoa detected under microscope.

Add benzoic acid, gr. x, to the *tr. ferri muriat.* mixture *t. d.*

8th. The coagulation has stopped, and the colour is paler than before.

12th. The urine quite clear and normal.

13th. The patient had an attack of fever, but the character of the urine remained unchanged.

20th. The improvement is stationary, and up to date (1st March) there has been no recurrence of symptoms.—*Indian Med. Gazette*, April 1, 1882.

Multiple Fibromata of the Skin.

Prof. von RECKLINGHAUSEN, of Strasburg, whose essay "On the Lymphatic Vessels and their Relation to the Connective-Tissue," 1862, has sufficed almost of itself to keep the author's name fresh in professional esteem, now comes for-

ward with another contribution to scientific medical literature.¹ The occasion of its publication is the twenty-fifth anniversary of the founding of the Pathological Institute, by Virchow, at Berlin, and the work bears on the title-page that it is a "Festschrift" offered to that illustrious teacher and leader of men.

The primary subject of the essay was a case of multiple fibromata of the skin in a woman, aged 55, who was brought to the Strasburg Hospital in January, 1879, and died, a few hours after admission, of bleeding from the lungs. The occasion was used to make a thorough examination of the external tumours, of certain coexisting tumours (neuromata) on the course of some of the nerves (lower extremity chiefly), as well as of a very obscure condition of the internal organs and their serous coverings. Subsequently the author had the opportunity of observing another case of multiple fibromata of the skin during life. Photographs are given of both cases. Besides the discussion of those two cases, the essay contains an elaborate *résumé* of all the available recorded cases of multiple fibromata and multiple neuromata, which will save the time of all subsequent inquirers into the subject. Cases of multiple morbid products in the body used to be the favourite opportunities of demonstrating the existence of a dyscrasia or diathesis or morbid state of the blood. When the structural complexity of the tissues came to be recognized, that general point of view was gradually abandoned, and attention was concentrated on histological analysis. When all the details are mastered, there can be hardly any doubt that we shall come back to the generalizing standpoint which had for a time to be given up. But Professor von Recklinghausen's judgment upon his first case will show how far off we still are from the simple generalizations of pre-microscopic times. The skin of the whole trunk, head, and limbs of the body examined was covered with soft, fibrous tumours (*fibro-molluscum*); there were fibrous thickenings (so-called neuromata) in the course of several of the nerves (branches of the sacral plexus, of the anterior crural, several intercostals, frontal, and supraorbital); there were fibrous nodules in both breasts. Leaving the external parts, there was some clear fluid in the abdomen, with adhesions in various parts; numerous small nodules on the serous coat of the stomach, mostly of miliary size and somewhat transparent; small outgrowths on the capsule of the liver, not amounting to circumscribed nodules like those of the stomach; on the surface of the diaphragm, right side, soft villous-like outgrowths; several large nodules, stalked or sessile, on the serous surface of the small intestine, two of them being of hemorrhagic appearance and sarcomatous structure; on the surface of the left kidney numerous white patches with translucent miliary nodules in them, and a few whitish nodules in the substance of the papillæ; in the liver a few small red spots with white centres; in the mucous membrane of the jejunum, several small nodules with one small ulcer; small ulcerations in Peyer's patches, with here and there a small nodule, not caseous, in the submucosa; in the lower part of the ilium the ulcers had become confluent and had thickened edges; a few follicular ulcers in the colon. Coming next to the thorax, the pericardial surfaces were united by adhesions, in the midst of which lay nodules, but these were "not undoubted fibromata;" small excrescences on the mitral valve; on the posterior wall of the trachea numerous miliary nodules (one as large as a pea), translucent, tough, sessile, with vascular surroundings; in both lungs numerous small centres of induration, partly in the form of miliary nodules, smooth-walled vomicæ in the right lung, and in the left a few circumscribed gray hepatizations of unusual dry-

¹ "Ueber die multiplen Fibrome der Haut, und ihre Beziehung zu den multiplen Neuromen." Von F. von Recklinghausen, Professor in Strasburg. Berlin, 1882. pp. 138. Five plates.

ness. Lastly, two or three soft tumours were seated on the periosteum of each tibia in front.

What, then, does Professor von Recklinghausen make of this extraordinary case, the *post-mortem* record of which he has drawn up with so much fidelity and completeness? He takes the fibromata of the skin as his point of departure; these were formations chiefly of the lower layers of the cutis vera (involving sweat-glands and hair-follicles in various ways), and they sometimes sent prolongations downwards, into which nerve-fibres could be traced. The latter circumstance was a link connecting the multiple fibromata of the skin with the coexisting fibrous thickenings on several of the surface-nerves of the lower extremity, thorax, and forehead; these are called neuromata, although the nerve-fibres are, generally speaking, passive and merely inclosed in the fibrous growth, as in the so-called ganglia which form on certain peripheral nerves where they are exposed to pressure. Both kinds of new formation are, therefore, grouped under the common name of neuro-fibroma. Further, the neuro-fibroma explanation is extended to the new formations in the interior of the body, or rather to a select few of them. Encouraged by a previous observation made by Sangalli, who also found multiple fibromata of the skin to coexist with numerous similar nodules of various sizes on the surface of the stomach, the author sought to trace a connection between the latter and the nerves of the gastric plexus. The nodules on the external surface of the stomach and intestine showed, to the naked eye, characters which distinguished them from the new formations of such diseases as tuberculosis and lymphoma; some of them were too large (cherry or walnut size); the miliary ones were too hard, and were isolated in the muscular coats, whereas tubercles are apt to become confluent on the serosa. Under the microscope they were composed of the same connective-tissue as the cutaneous tumours, fibrous, but scarcely at all fibrillar, and with a few small spindle-cells. Lastly, they were not subject to caseous degeneration. But were they in reality connected with branches of the gastric plexus of nerves? Only in the case of one small nodule on the stomach did Professor von Recklinghausen succeed in following a nerve-fibre into the midst of it; the task was accomplished more easily—and a figure is given among the illustrations—for a fibrous nodule of the mesentery. To eke out this somewhat scanty evidence, he adduces the fact that in the teased preparations from two of the stomach nodules there were found in the midst of the fibromatous tissue a number of large polygonal cells, whose protoplasm was finely granular and without fatty molecules, and whose nucleus was invisible. They were not, therefore, young giant-cells, but more probably atrophied ganglion-cells of the plexus myogastricus. The nodules in the trachea contained true giant-cells, as well as round cells; they had also a “degenerated centre,” and they were real tubercles, and not miliary fibromata; so that the absence of nerves in them was the less surprising. The periosteal nodules of the tibia showed nerve-fibres in the sections, but the new growth, which appears to have been more sarcomatous than fibromatous, was not laminated around them. Again, the larger tumours of the serous membrane of the jejunum were also of the sarcomatous kind, and highly vascular, while they had no obvious relation to nerves, not even an accidental one. Lastly, it was not possible to trace any connection between the multiple fibromata of the breasts and the nerves of those organs; nerves were not even seen in the sections.

Thus far, in the negative direction and in the positive, does Professor von Recklinghausen carry his analysis: to the multiple fibromata of the skin he adds the fibrous thickenings on the external nerves, and he combines both under the name of neuro-fibroma. To these neuro-fibromata of the external surface of the body he inclines to add a few at least of the serous-membrane formations, as

neuro-fibromata of the sympathetic. There were, it is true, formations also on the pericardium, on the diaphragm, on the liver, on the kidney, in the trachea, in the lungs, in the liver substance, in the kidney substance, in the mucosa of the intestines, and in the breasts. There were also sarcomatous tumours of the surface of the jejunum, and of the tibial periosteum. What is to be made of all these curious manifestations of disturbed health, does not appear. Professor von Recklinghausen seems to regard them as the ninety-and-nine things that need no explanation. He has been arrested by the coexistence of multiple fibromata of the skin with fibrous thickenings on the course of some of the cutaneous nerves (chiefly at exposed stations), and he has been led into a theory of fibro-neuroma, which does not appear to contain within it any fruitful pathological idea, and which carries him only a little way over the case as a whole. Nothing shows more clearly than this bewildering eclecticism how distant that time is when we shall again be using the simple generalizations, the empirical but still philosophical language of diathesis or dyscrasia, which distinguished the pre-microscopic age.—*Med. Times and Gaz.*, April 15, 1882.

Leprosy.

The following conclusions with regard to the bacterial nature of this disease are given by Dr. ALBERT NEISSER (*Virchow's Archiv*, Bd. 84, No. 3):—

1. Leprosy is a true bacterial disease caused by a special variety of bacteria.
2. These bacteria enter the organism as such, or, more likely, as spores, and remain in a state of incubation in certain depots, the lymphatic glands, perhaps, for a longer or shorter period of time. The term of incubation of these bacteria varies greatly, not only as compared with the incubation stages of other infectious diseases, but also in different cases of leprosy.
3. From the above-mentioned depots the disease spreads in the body, principally in the skin (*lepra tuberosa*), and notably in those regions exposed to insult, the face, hands, elbows, and knees, and also in the peripheral nerves (*lepra anæsthetica*). Other parts of the body, testicles, spleen, cornea, cartilages, and liver, are less subject to invasion.
4. The bacteria or spores give rise to inflammatory processes in organs or parts of the body which are supplied with bloodvessels, but in those parts where there are no bloodvessels to immigrations (*Einwanderungen*) of cells from the periphery inwards. The lymphatic cells containing spores or bacteria constitute the material of which the special neoplasmata of leprosy are made up. The specific action of these bacteria transforms the ordinary wandering cell into the specific cell of leprosy, the shape, course, and disappearance of which are characteristic.
5. Leprosy is probably an infectious disease, and its specific products are contagious. The disease is not only directly contagious, but also indirectly so, its specific bacteria or germs being transferred by various objects.
6. Leprosy is not hereditary.—*Boston Med. and Surg. Journal*, April 27, 1882.

Acne Keloid.

At a meeting of the Pathological Society of London, held April 18, Mr. MORRANT BAKER said that, so far as he was aware, no case of this disease had been recorded in England. The patient, who was in attendance, was a middle-aged man, who presented in the nape of the neck a flat patch, with an indented overhanging edge, and a smooth, dark-red surface, which projected about one-eighth of an inch above the surrounding skin. A few hairs in bundles projected through

the surface of the tumour from a lower level. The skin was not especially sensitive; surrounding the patch were a number of firm tubercles, each perforated by a hair, which issued from its summit. The summit had a yellow pustule-like appearance. The larger patch was evidently formed by an aggregation of many of these tubercles. These smaller tubercles closely resembled at first sight the pustules of *acne vulgaris*, but were entirely different in structure; for each seemed to be composed of soft, unbroken, red-scar tissue, its summit perforated by a hair, which was rendered especially evident by the yellow quasi-pustular appearance of the epidermis which surrounded the orifice of the follicle. The patient suffered very little inconvenience. He was a butcher, aged forty-seven, who was in excellent health; he attributed the origin of the growth, which began about four years earlier, to a poisoned wound, but this was apparently a mere guess. Mr. Baker had met with one other instance only of the disease; the patient was an old gentleman, who attributed the disease to the irritation of the edge of the collar; he declined any cutting operation, but consented to cauterization with nitric acid, and the growth did not recur. Professor Kaposi, in writing on *Frambæsia*, referred to a disease in which bright-red, papillary, weeping, and partially ulcerating excrescences (which bled easily) existed on the scalp, and proposed to call it *Dermatitis papillomatosa Capillitii*; but Mr. Baker would not have thought of identifying his case with this disease, but that Professor Kaposi and Dr. Hans Hebra, who saw the case during the Congress, recognized it as identical with the disease described by the former. M. Verité informed him that it was identical with the disease called *acne keloid* by M. Bazin, and Mr. Baker preferred to make use of this term, because it expressed fairly well the naked-eye features of the growth.—*Brit. Med. Journ.*, April 22, 1882.

SURGERY.

The Value of the Details of Listerism in Abdominal Surgery.

MR. LAWSON TAIT read a paper on this subject before the Surgical Society of Ireland on February 24. There were three general principles, or axioms, with a statement of which he would begin his paper: 1. In discussing the question, all empirical statements should, as far as possible, be avoided. 2. The smaller the range and the fewer the disturbing elements the better; *i. e.*, for the deciding of such questions, it was better to compare the results obtained in one series of operations, for example, ovariectomies, than to compare those of several series of major and minor surgical operations. In other words, a series of repetitions was more likely to give accurate results than mixed cases. 3. In the peritoneum was a cavity peculiarly susceptible to septic influences; the abdominal viscera were, therefore, a peculiarly good field for such an investigation. The basis of Lister's theory of putrefaction by means of bacteria, etc., had long ago been proved beyond dispute as regards dead matter. But Mr. Lister assumed for living matter the same sequence of events as in the case of dead. This had never been proved. If a wound were full of blood-clot, and this was kept antiseptic, it would become organized, and form part of the tissue it lay near, just as a blood-clot would do in the interior of the body, being, in both cases, protected from the attacks of the *bacteriæ* in the air. Blood-clots in the body were not truly dead, but only in a low state of vitality, insufficient, however, to preserve them from the attacks of *bacteriæ*. Dr. J. Hamilton, of Edinburgh, in his experiments on sponge-graft-

ing, had shown that a thoroughly dead sponge would do without Listerism what the blood-clot would do with it—viz., become organized. It would even do this in a putrescent wound, because it was sufficiently tough to resist the attacks of the bacteria, while the bloodvessels of the neighbourhood were working their way into, and forming a network through, its substance. In the same way, the blood-clots, being finely porous, offered support to the fine bloodvessels developed; but being too frail to resist the attacks of bacteria, became putrescent before time had occurred for the vessels to be formed, unless protected by antiseptics. Mr. Tait enunciated his opinions to the effect that, whilst accepting the germ-theory, he repudiated Mr. Lister's application of it in surgery. However, putting theory and inclination aside, he determined to give Listerism a fair trial in one hundred abdominal sections, nearly sixty of which were for ovarian tumours; and the conclusions arrived at were all against Mr. Lister's views. The most valuable information was to be obtained, not by noting the ratio of deaths, but by observing under what mode of treatment the recoveries were most easy, even, rapid, and uncomplicated. For this purpose he exhibited comprehensive charts of a large number of cases treated by various methods, showing temperature, pulse, duration, etc., of the cases in each group. Those treated by complete Listerism gave the worst results. He, therefore, wished to try if this result was due to the method or to the carbolic acid used. He divided the investigation into three groups: (1) the use of the spray; (2) the preparation of the sponges; and (3) the details during the operation. In group 1, the spray was used regularly, beginning with the carbolic acid solution, 1 in 20; then reduced to 1 in 30, then to 1 in 50, 1 in 100, 1 in 1000, and finally a spray of pure water was used. The recoveries improved in each as the carbolic acid was reduced in strength. In group 2, the sponges were treated with solutions of the acid gradually reduced in strength, as in group 1, with similar results; so also group 3. The investigation lasted over two years. He, therefore, gave up the use of carbolic acid altogether; but still keeps his instruments, ligatures, sponges, etc., in a bath of pure water—not to avoid bacteria, but to keep them wet. Bacteria, which produced putrefaction in dead matter, he considered harmless in the living peritoneum. Lister's plan had done an infinity of good, but his theories of its action had been proved to be untenable.—*British Medical Journal*, April 15, 1882.

Sulphide of Calcium as an Antisuppurative.

Dr. ANDREW H. SMITH, Chairman of the Committee on Restoratives of the Therapeutical Society of New York, furnishes to the *New York Medical Journal and Obstetrical Review* for June, 1882, a report of the committee on the use of sulphide of calcium for the purpose of preventing or diminishing suppuration. After giving the experience of several members of the society, Dr. Smith concludes his report as follows: Judging from this limited number of cases, it would seem that we are warranted in concluding that in many cases of suppurative affections, ranging from the small pustules of acne to extensive suppurating surfaces, an appreciable, and often a very marked, benefit is derived from the use of the calcium sulphide, suppuration which would otherwise take place being averted, or the quantity and duration of an existing discharge being lessened. At the same time its action is not uniform; and in many apparently favourable cases it will fail entirely. The drug is somewhat prone to irritate the stomach, and this circumstance affords an indication for small doses frequently repeated, instead of larger ones at longer intervals. One-tenth of a grain every two hours in acute cases will generally secure the full therapeutical action of the drug, but larger doses may sometimes be required, and some patients will bear well a grain

three or four times a day. Even in small doses the sulphide will occasionally produce headache, and the patient is usually more or less annoyed by eructation of sulphuretted hydrogen.

A Method of Removing Benign Tumours of the Breast without Mutilation.

Prof. T. GAILLARD THOMAS, Surgeon to the New York State Woman's Hospital, contributes to the April number of the *New York Medical Journal and Obstetrical Review* a paper in which he expresses himself in favour of removing benign tumours of the breast as a rule, because the mere presence of a tumour in the breast usually renders the patient apprehensive, nervous, and often gloomy, while with our present improved methods of operating, the patient is exposed to slight risks, the danger of growth of the tumour is removed, and with this disappears at the same time that of the subsequent degeneration of a benign into a malignant growth. If, in addition to these advantages, we can add the avoidance of all mutilation to the person, we have strong grounds for departing from the practice of non-interference. The method of operation described Dr. Thomas has practised thus far in a dozen cases. He distinctly states that it is entirely inappropriate for tumours of malignant character, and that it is applicable neither to very large nor to very small benign growths, being insufficient for the former and unnecessarily radical in its character for the latter. The growths for the removal of which he has resorted to it have been fibromata, lipomata, cysts, and adenomata, and have varied in size from that of a hen's egg to that of a duck's egg or a little larger. The operation is thus performed: The patient standing erect and the mamma being completely exposed, a semicircular line is drawn with pen and ink exactly in the fold which is created by the fall of the organ upon the thorax. This line encircles the lower half of the breast at its junction with the trunk. As soon as it has dried the patient is anæsthetized, and with the bistoury the skin and areolar tissue are cut through, the knife exactly following the ink-line until the thoracic muscles are reached. From these the mamma is now dissected away until the line of dissection represents the chord of an arc extending from extremity to extremity of the semicircular incision. The lower half of the mamma which is now dissected off is, after ligation of all bleeding vessels, turned upward by an assistant and laid upon the chest-walls just below the clavicle. An incision is then made upon the tumour from underneath by the bistoury, a pair of short vulsella forceps is firmly fixed into it, and, while traction is made with it, its connections are snipped with scissors, the body of the tumour being closely adhered to in this process, and the growth is removed. All hemorrhage is then checked, and the breast is put back into its original position. Its outer or cutaneous surface is entirely uninjured, and the only alteration consists in a cavity at the former situation of the tumour. A glass tube with small holes at its upper extremity and along its sides, about three inches in length and of about the size of a No. 10 urethral sound, is then passed into this cavity between the lips of the incision, and its lower extremity is fixed to the thoracic walls by India-rubber adhesive plaster, and the line of incision is closed with interrupted suture. In doing this, to avoid cicatrices as much as possible very small round sewing-needles are employed; these are inserted as near as possible to the edges of the incision, and carry the finest Chinese silk. After enough of them have been employed to bring the lips of the wound into accurate contact, the line of incision is covered with gutta-percha and collodion, and the ordinary antiseptic dressing is applied. If the glass drainage-tube acts perfectly, there is no offensive odour to the discharge, and the temperature does not rise above 100°: the tube is in no way interfered with until the ninth day, when the stitches are removed. If, on

the other hand, the tube does not appear to perform its function satisfactorily, it is manipulated so as to cause it to drain all parts of the cavity, and warm carbonized water is freely injected through it every eight hours. On the ninth day, when the stitches are removed, the tube is removed likewise.

Diagnosis of Injuries of the Abdomen.

In a communication by Dr. BECK on cases of injury to the intestines, liver, and bladder (*Deutsche Zeitsch. für Chir.*, Band xv.; *Med.-Chir. Rundsch.*, 1882, p. 112), it is stated that a prompt and decided diagnosis as to rupture of an internal organ in cases of a blow on the abdomen is attended with extreme difficulty, since there is not any one characteristic symptom of such lesion, and it is only through careful observation and study of all the symptoms that a correct conclusion can be attained. Of the general symptoms, a high degree of shock, which condition is rarely absent in cases of severe abdominal concussion, indicates laceration of an internal organ. Intense and persistent collapse, associated with a thready and very rapid pulse, and shallow and quick breathing, will remove any doubt as to the occurrence of internal bleeding. Whilst with simple abdominal contusion, febrile phenomena are seldom observed, a high and increasing temperature, together with increase of the pulse and respiratory movements, would indicate peritonitis from effusion of intestinal contents. Of the local symptoms, the most important is that of pain, which is localized, spontaneous, and but slightly affected by pressure. This pain steadily increases in severity until the stage of intestinal paralysis, when it ceases. In cases of contusion, on the other hand, the pain is not so acute; it is increased by pressure, varies in intensity at different times, and often ceases suddenly. The physical abdominal symptoms, as swelling, distension, resistance, and the changes in percussion-sounds, have not, Dr. Beck holds, the diagnostic value that have been claimed for them by Dr. Moritz (*St. Petersburger Med. Woch.*, 1879). Sudden tympanites, with a clear sound over the hepatic region, is not likely, in Dr. Beck's opinion, to occur with rupture of the intestine, unless this rupture be very extensive. In ordinary cases, the intestinal gas escapes into the abdominal cavity so gradually, and in such small quantities, that it could not give rise to any sudden and marked external signs. On the other hand, in some cases of abdominal contusion without rupture of intestine, Dr. Beck has made out a clear percussion-sound over the region of the liver, this condition having been due to paralysis of a small portion of intestine, and to accumulation above this paralyzed portion of a considerable quantity of gas.

The later local symptoms observed in cases of intestinal rupture are usually but the results of the peritonitis due to escape of poisonous gas. Immobility of the patient and dread of being disturbed are not, it is stated by Dr. Beck, characteristic symptoms of ruptured intestine. In almost every case of abdominal injury, the patient at first remains at absolute rest; but, in advanced stages, in cases of rupture, and after peritonitis has spread extensively, the patient, suffering from pain and the distension of tympanites, endeavours to allay his intolerable condition by frequent changes of position. Much importance is to be attributed to vomiting, which, in cases of slight abdominal injury, soon ceases after the disappearance of the symptoms of shock. In cases, on the other hand, of communication between the intestinal canal and the peritoneal sac, vomiting steadily increases, and the patient is much troubled by frequent and profuse ejections of bilious fluid. Retention of urine and difficulty of micturition are to be regarded as symptoms of some value. Neither of these is likely to be observed in cases of slight abdominal injury; but the use of the catheter is often required when peri-

tonitis has resulted from rupture of the intestine, or of some other internal organ. The following conditions indicate with certainty the occurrence of rupture of the bladder: intense pain in the region of the bladder, anuria, signs of the presence of free fluid in the peritoneal sac, swelling and distension of the abdomen, purulent peritonitis, which, however, does not run so rapid a course as that due to rupture of intestine, pelvic infiltration, and a small quantity of urine in the bladder, and this mixed with fluid or coagulated blood. The extent and severity of this collection of symptoms vary in different cases, according to the seat of the vesical rupture.

In discussing the treatment of abdominal injury from direct violence, particularly from a kick, Dr. Beck points out that it is advisable, in cases of doubt, to take the most unfavourable view of the case, and to treat the patient in accordance with such view, by insisting on absolute rest, by applying leeches and cold compresses to the abdomen, and by administering opium internally, or, when there is obstinate vomiting, by giving subcutaneous injections of morphia. The patient should occasionally suck small lumps of ice, and be restricted to cold and fluid nourishment. By no means should any clyster be administered, lest, by such treatment, active movements of the injured intestine be excited.

It has been proved, on *post-mortem* examination, that, under such treatment as this, sealing together of the margins of the intestinal rent by fibrinous exudation and even firm occlusion may result; but, in such cases, when but even a very small quantity of intestinal contents has been effused, this treatment rarely results in cure. Operative interference, in cases of intestinal rupture, ought, in Dr. Beck's opinion, not to be considered; as in many of these cases the rupture is inaccessible through its deep situation, and through the gluing together of the intestinal loops by the products of recent peritonitis.—*London Medical Record*, April 15, 1882.

The Elastic Ligature in Abdominal Surgery.

A recent number of the *Berliner Klinische Wochenschrift* contains an interesting communication on the intra-peritoneal treatment of the pedicle of uterine fibroids, and the removal of tumours and parts of the abdominal viscera by the elastic ligature. The paper is by Dr. KASPRZIK, assistant in the Freiburg gynecological clinic, and is based upon experiments conducted by Professor Hegar. The author believes that in the elastic ligature a means has been discovered by which not only the complete, but the partial, removal of the spleen, kidneys, omentum, even of the liver, can be accomplished without excessive risk. The extremely favourable results which Professor Hegar had obtained with the elastic ligature in the extirpation of uterine fibroids—the risk of secondary hemorrhage being by it almost completely abolished—led him to devise a series of experiments to test its behaviour in the abdomen, and its applicability to other possible requirements of abdominal surgery. The first set of experiments were performed to see what happens when a bit of India-rubber tubing is left in the abdomen. They show that it was borne exceedingly well, that it did not excite suppuration or peritonitis. In the second group of experiments, pieces of omentum, uterus, spleen, liver, and kidneys were surrounded with the elastic ligature, and the piece thus secured cut away either with knife, scissors, or the platinum blade of Paquelin's cautery. It was found that parts of the uterus, omentum, or spleen might thus be removed with safety. In the case of the omentum and uterus, India-rubber threads were sufficient; but in that of the spleen, thin solid cords were found to cut through the tissue; but when a piece of India-rubber tubing was used the results were successful. The experiments in removal of pieces of liver and kidney terminated unfavourably; but they were

few in number, and Professor Hegar hopes that, by continuing them, knowledge may be gained as to the kind of ligature, and the tension to be put on it, which may lead to success here also. In any case, he thinks, he has proved that the stump of the uterus may be treated with the elastic ligature without risk. He does not think, however, that on that account the question of the intra- or extra-peritoneal treatment of the stump is finally settled. The *technique* of the elastic ligature is very important. It is necessary to know how much stretching the India-rubber will bear, and how much will be best for the stump. The firmer the tissue of the latter, the higher will be the tension of the ligature required to arrest hemorrhage. If, on the other hand, the stump is soft and vascular, a too tightly stretched ligature will cut through it, and dangerous hemorrhage result. The ordinary method of tying does not suit the elastic ligature, because it slips before the knot can be made fast. Professor Hegar, therefore, simply crosses the ends, seizes them with a special pair of forceps, something like scissors with blunt blades, and then ties together with silk or wire the ends of the ligatures where they cross one another, between the forceps and the stump. The ends are then cut off on the other side of the forceps, and the latter removed.—*Med. Times and Gaz.*, May 6, 1882.

Excision of the Pylorus.

The *Wiener Medizinische Blätter* of May 18th contains an account of a discussion, at a recent sitting of the Congress für Innere Medizin, on the diagnosis of carcinoma of the stomach, and on the operation of resection for that disease. Dr. HENCK, of Heidelberg, read the case of excision of the pylorus for carcinoma performed ten months ago by Professor Czerny, which was briefly described by the latter surgeon at the International Medical Congress, and is recorded in its *Transactions*; and it is satisfactory to learn that the patient, who gained eleven pounds' weight at the end of the sixth week of the operation, was, at the beginning of last month, ten months after the operation, quite well, with no symptoms of recurrence of the disease. Dr. Henck tabulated the clinical history of twelve resections of the stomach. One, which recovered, was performed in a case of stricture of the pylorus following perforating ulcer. The remaining eleven were for the removal of cancerous growths; four of these recovered from the operation; out of the recoveries, three patients are still alive, and free from any recurrence; the fourth is known to have died four months after the excision, from a return of the disease. In the discussion which followed the reading of Dr. Henck's paper, Professor Lichtheim observed that mobility of an abdominal growth detected by palpation in the region of the pylorus was no proof that, if the growth were pyloric, there were no adhesions. In a case under his care, the swelling could be freely moved about under the abdominal wall when the patient was narcotized; yet, on opening the abdominal cavity, the pylorus was so strongly adherent to neighbouring parts, that its removal was impracticable. Professor Kühle stated that the rapid implication of the chain of lymphatic glands in front of the bodies of the vertebræ behind the stomach, in cancer of that organ, renders many cases unsuitable for surgical treatment. Dr. Henck remarked that the same objection stands in the way of operation in cancer of any other organ. As early diagnosis is so important, Dr. Ewald asked if the members of the Congress could confirm the theory of Van der Velden, that free hydrochloric acid was absent in the gastric juice in cancer of the stomach; but no researches had been made towards the confirmation of this theory by those present who had some experience of operations for the radical cure of malignant gastric disease.—*British Med. Journal*, June 3, 1882.

Lumbar Colotomy for Stricture of Descending Colon.

At the meeting of the Royal Medical and Chirurgical Society of London, a paper was read upon a case of excision of a stricture of the descending colon, through an incision made for a left lumbar colotomy, with remarks, by Mr. THOMAS BRYANT. This was a case of stricture of the descending colon, in which he excised the diseased segment of bowel through the wound made for a left lumbar colotomy, the patient recovering. The operation was performed on a lady aged fifty, who had suffered from complete obstruction for eight weeks, and was very feeble. The stricture could not be felt from below. The bowel was removed through the oblique incision made for left lumbar colotomy, by simply pulling the strictured segment through the wound and stitching each portion of the bowel with its two orifices as divided to the lips of the wound. The stricture was of the annular kind, and involved about one inch of the bowel. It was so narrow as barely to admit the passage of a No. 8 catheter. The preparation was exhibited with microscopical appearances of the growth in section as made by Dr. Goodhart. Mr. Bryant said he believed the operation he had performed was a new one, and that it was applicable to not a few of the cases of stricture of the descending colon. It had suggested itself to his mind from seeing cases of localized or annular stricture of the bowel which were free and movable, both in operations of colotomy as well as in the post-mortem room; but the case read was the first in which he had put the suggestion into practice. He pointed out how these annular strictures were generally local diseases, and, consequently, how desirable it was that they should be removed where possible. He suggested that the question of the excision of the diseased growth should be entertained as soon as the diagnosis of the case was made, and that to every case of colotomy for chronic obstruction of the descending colon the possibility of being able to remove the diseased bowel by operation should be considered before the bowel is opened for a colotomy operation. He then showed how desirable it was that the question of excision or of colotomy should not be postponed till the patient's powers were too feeble to bear either, as is now too often the case. He did not regard the operation he had performed as more serious than a colotomy in which the peritoneum was wounded.

Mr. JOHN MARSHALL remarked on the interest and importance of the paper, and the distinction from other cases where portions of the bowel have been removed, and the segments reunited. Mr. Bryant's operation was less formidable, but fully as effectual in affording relief.

Mr. G. POLLOCK thought the case redounded very much to the author's credit. He was not aware of a similar case, and believed it to be the first in British surgery. Two or three years ago he (Mr. Pollock) considered this operation should be performed, and discussed it with his colleagues. In a case in which he had performed left colotomy he got below the stricture, which could be felt above, but it was too bound down by adhesions for removal. A right colotomy was, therefore, done, and death ultimately took place; the long continuance of distension had produced a cracking of the peritoneal coat, a result he had often seen, and one which could be obtained experimentally. In one case of stricture of the sigmoid, one like Mr. Bryant's, the patient survived colotomy two years and ten months, when he died from fatty degeneration of the heart, and post mortem the disease was found to have very little extended, only a coil of small intestine had just become adherent to it. In this case he believed the removal of the stricture might have much prolonged life, had the cardiac conditions not been present. Mr. Pollock was sure that he had seen cases in which this operation might have been performed.

Mr. CRIPPS had often thought of the same thing before, and so far as he knew, Mr. Bryant was the first to do it in this country, although last year it had been done in Germany, and Billroth acted on the same principle in excising pyloric stricture. All these strictures commence as a deposit of adenoid growth in the submucous tissue. After a while ulceration and cell proliferation occur, and a constriction takes place, and the disposition of the muscular fibres determines the annular form of the stricture. The malignancy of the disease lay not so much in the growth itself as in the locality attacked, and if removed there may be no recurrence. He suggested that in sigmoid strictures an incision should be made external to the rectus muscle, so as to expose the diseased part more fully than is possible in the confined space in the loin. In either case the peritoneum would have to be opened. The objection to reuniting the divided bowel would be the risk of fecal extravasation.

Mr. H. MARSH mentioned the case of a woman fifty-four years of age suddenly seized with symptoms of acute intestinal obstruction, so that the diagnosis of a constricting band was made. The abdomen was carefully opened in the middle line, when the cause was found to be an annular stricture in the upper part of the sigmoid. The uncertainty of being able to remove the disease by lumbar incision is very great, and, therefore, knowing how limited the diseased condition in these cases is, the better course would be to open the abdomen, as Mr. Cripps had mentioned, which would probably give more successful results than Mr. Bryant's plan. He followed Mr. Pollock in urging early operations, for if the intestine be allowed to get over-distended the operation was certain to fail.

Mr. H. MORRIS quite agreed with Mr. Marsh and Mr. Cripps, that if the operation is to be introduced for all forms of stricture abdominal section was preferable, but in such cases as Mr. Bryant's the colotomy incision was better, for it requires only one incision into the peritoneum, and the distended bowel adds greatly to the risk of fecal extravasation. In a case in which he removed a large part of bowel for intussusception, he was obliged to stitch the two ends together on one aspect, and to make an artificial anus in the front of the abdominal wall.

Mr. BRYANT, in reply, said that he felt it best to adhere to the lumbar incision, the oblique one he published admitting of more space than the ordinary colotomy wound. Thus at least four or five inches of the descending colon can be dealt with in the dead subject, and more than that in the living. It must also be borne in mind that nine-tenths of the strictures are in the descending colon and the rectum; and of the former the majority involve the sigmoid and splenic flexures. If the part is movable, it can be excised; the operation is not possible when there are adhesions, and that would be an objection to opening the abdomen in front. The question should be excision, if practicable; colotomy where excision is not feasible.—*Lancet*, April 1, 1882.

Splenectomy.

Mr. WARRINGTON HAWARD read notes of a case of splenectomy at the meeting of the Clinical Society of London held March 24. The patient, a woman, aged forty-nine, had usually enjoyed good health. Had never suffered from ague or any intermittent fever. The catamenia had ceased three years. She had been seven years married, but had no children. For eighteen months she had suffered pain in the left side of the abdomen, and for ten months had been aware of an abdominal tumour, which had been steadily increasing in size, and which distressed her by its weight. When admitted into St. George's Hospital, she was a rather stout woman, of good complexion. She did not look at all anæmic,

and although the number of the white globules of the blood was increased, she showed no other sign of leucocythæmia, excepting a greatly enlarged spleen. The spleen occupied the greater part of the left side of the abdomen, and extended from the loin to three inches beyond the middle line, and from the ribs to the groin. The tumour was firm, well defined, and moderately movable. It produced great discomfort from its weight, and a dragging sensation whenever she moved about. There was no other glandular enlargement, and the rest of the viscera were healthy. She had no palpitation or dyspnœa, nor had she suffered any hemorrhage. Her temperature, pulse, and respiration were natural. The urine was natural. It having been decided to remove the spleen, Mr. Howard performed abdominal section for the purpose. An incision was made in the middle line of the abdominal wall, extending from two inches below the ensiform cartilage to within two inches of the pubes. The enlarged spleen at once presented, and was found free from adhesions. In endeavouring to tilt up the lower end of the tumour, a rent occurred at its upper margin, from which free hemorrhage took place for a moment, but the bleeding was speedily arrested by the pressure of a sponge upon the torn part. The vessels at the pelvis, which were enormously enlarged, were then clamped and ligatured, after which those of the gastro-splenic omentum were secured by passing an aneurism-needle threaded with silk through the membrane, and tying it in several separate portions. The connections of the spleen were then severed, and the organ delivered without further difficulty. Carbolized silk was used for the ligatures, and the only hemorrhage of any consequence was that which occurred from the rent in the spleen. While the wound was being closed, the patient suddenly became profoundly collapsed, but was revived by artificial respiration and the subcutaneous injection of ether. Five hours after the operation vomiting commenced, and, persisting with great frequency, rapidly exhausted the patient, who died in the evening of the day of operation. The spleen, both to the naked eye and microscope, presented the appearance of simple hypertrophy. Post-mortem, no disease of any organ other than the spleen could be discovered. There had been no hemorrhage after the closing of the wound, but the abdomen contained some thin blood-tinged fluid. With the exception of slight ecchymosis in the immediate neighbourhood of the wound, the peritoneum and abdominal viscera showed no sign of injury. The indications for and against the operation were considered, and it was shown that, although there was an increase in the white corpuscles of the blood, the patient exhibited none of the other signs of leucocythæmia excepting the large spleen; that there was no sign of anæmia nor tendency to hemorrhage; and that the condition of the blood would not have been suspected excepting on microscopical examination. The woman's suffering seemed entirely due to the dragging weight of the tumour, and there was no sign of any other visceral disease. The fatal result was certainly not caused by hemorrhage, which is the chief danger in cases of leucocythæmia, but seemed to be due rather to the disturbance of the great sympathetic plexuses, and the consequent shock and vomiting. The paper concluded with some remarks upon the method of the operation.

Dr. STEPHEN MACKENZIE was glad of the opportunity of raising the question whether removal of the spleen in leucocythæmia was justifiable. Recently a patient had been sent to him with a greatly enlarged spleen, and the blood was found to contain a great excess of colourless corpuscles. He informed the friends of the patient that, though ordinary methods of treatment might afford palliation and delay the progress of the disease, an unfavourable issue was inevitable. At the same time he mentioned that, in a few cases, the enlarged spleen had been removed, and the patient recovered; further, that the operation was a

very serious one, often fatal, and that very rapidly. After due deliberation, both the patient and his family desired that the operation should be performed. He (Dr. Mackenzie) asked his colleague Mr. Reeves if, in these circumstances, he was willing to operate; and Mr. Reeves expressed his readiness to do so. The patient was admitted into the London Hospital for the purpose. He was then found to have a little œdema of the feet, and it was decided to defer the operation until attempts had been made to improve his condition. At this time the proportion of colourless to coloured corpuscles was about one to seven, the coloured corpuscles being about 65 per cent. He was kept in bed, and dialyzed iron was given. Under this treatment the blood-state improved, so that the proportion of colourless to coloured corpuscles fell to one to eighteen or nineteen, and the coloured corpuscles rose to over 70 per cent. Meanwhile Mr. Collier's tables, giving the results of the whole of the recorded cases in which the spleen had been removed, appeared—showing that, though the spleen had been excised successfully in several cases, in no case had the operation succeeded when it had been performed for leucocythæmia. On conferring with Mr. Reeves, it was felt right to inform the patient that, since the operation had been mentioned, the subject had been carefully investigated, and it was found that no case of exactly the same nature as his had recovered; and that, in these circumstances, it was felt right to advise him not to undergo it. The patient and his father, however, made up their minds that, in spite of this information, they wished the operation performed, seeing that, if it were not done, death would only be delayed. He (Dr. Mackenzie) noticed on this occasion, however, that the œdema of the feet, which had disappeared, had returned, and that there was a slight puffiness of one hand; and that, though the blood-state had improved, the patient's general condition was not so satisfactory, and leukæmic retinitis and retinal hemorrhage had made their appearance. In these circumstances, he strongly advised Mr. Reeves not to accede to the patient's request, believing that the operation would be rapidly fatal. As regarded theoretical considerations, it must be admitted that to a certain degree the operation was an experimental one, and the very unfavourable results hitherto obtained did not offer any encouragement. But if, as was asserted, the disease took its origin from malarial affection, there were grounds for believing the spleen was primarily at fault, and removal of the organ might be expected to benefit the patient, provided it could be safely performed. It therefore seemed to him desirable to raise the point whether the operation was justifiable when the blood-disease was not too advanced, in young subjects.

Mr. CLEMENT LUCAS said the terrible mortality which followed excision of the spleen in leucocythæmia—a mortality which left no case of recovery—ought not to discourage surgeons from attempts to relieve a fatal disease, but rather to direct their attention to less serious operations than excision, which might possibly effect a cure. If the disease were a simple hypertrophy, would not ligature of the splenic artery reduce the size of that organ and bring about relief? Ligature of the main artery in cases of Barbadoes leg was followed by great reduction in the size of the limb, and a similar operation for the spleen held out hopes of cure. The operation might be difficult, but, with a free incision, ought not to be impracticable, and could scarcely be so serious as that for the removal of the whole organ.

Mr. REEVES now had a case in which the operation had been seriously contemplated, but as Dr. S. Mackenzie had given such a good account of it, there was no need for him to say anything on that head. His reasons for desiring to operate were the youth of the patient, the fact that the disease was not far advanced, and the physical vigour, as well as the determined mental condition of

the patient, and his friends, who—after every risk was plainly put before them—decided to have the operation done. Mr. Reeves had looked up twenty-one cases of splenectomy, and found that about a quarter had recovered. But, very shortly after, Mr. Collier's paper appeared, pointing out that all the leucocythæmic cases which had been operated on had died. This, of course, made him hesitate; but on analyzing the table he found that most of the cases were much older than his patient, and were in a more advanced stage of the disease, so that he was still inclined to give his patient the forlorn hope offered by operation; but on consultation again with Dr. S. Mackenzie it was decided that, although the blood-condition had much improved, still, on the whole, operation must not now be thought of. He thought that, if patients were seen in an earlier stage, the operation would have a much better chance, but at present our knowledge was very imperfect, and, seeing that leucocythæmia was so common among some of the lower animals, it was highly desirable that observations and experiments on them should be made, with a view of ascertaining if removal of the diseased spleen was followed by permanent benefit. He had thought of tying the splenic artery, but shrank from it, because he feared that the spleen might necrose and necessitate its removal, thus adding a second severe operation to one which would, no doubt, be difficult, and, under the circumstances, very hazardous. It was most desirable, by selecting proper cases, to ascertain if surgery could be of use, where medicine had, unfortunately, been hitherto invariably unsuccessful. Malaria was said to be a frequent cause of the disease, and without denying this, he would ask, was it a common cause, or a cause at all, in the lower animals? Dr. Eadie, of Pimlico, had recently consulted him in reference to a case of a strong, well-built gentleman, aged twenty-two, who had never been exposed to malarial influences, whose circumstances had been always unusually good, and who had never had syphilis. At one time this patient was extremely weak, and looked very like dying, but lately he had much improved in blood-condition and general strength. His spleen was about three and a half times its normal size. This case was quoted as showing that something other than malaria, insufficient food, hygienic surroundings, and syphilis was at work in this instance.

Dr. GOODHART said that Mr. Warrington Haward had asked the question—a very important one—whether a mere excess of colourless corpuscles in the blood was of itself sufficient so to interfere with the coagulability of the blood as to condemn an operation. Dr. Goodhart thought that that question was capable of answer by the experience of the post-mortem room. This, now, in his experience, amounted to five or six cases, and in all it had been the same, that the coagula in the heart and great vessels were peculiarly flimsy, and in general appearance more like pus than blood. Of course it might be said that this was hardly an argument, seeing that by the time a case arrived at a fatal issue it had probably overstepped the distinction drawn by Mr. Haward between early and late leucocythæmia. But that was not the case. So far as the blood was concerned, cases were fatal with a far less proportion of white and red corpuscles than one in six. This proportion exists in Mr. Haward's case, and therefore, so far as the blood was concerned, he thought it might always be said of it that it was in a similar condition to that found in fatal cases. Looking, also, as he did, upon the existence of leucocythæmia as a late symptom, he doubted whether any case of leucocythæmia could, with propriety, be called early. But there was also another point to be considered, and that was the effect of an operation and the resulting pyrexia upon the condition of such blood as existed in these cases. He thought he had observed that they bore fever badly, and that the blood had a tendency to be more pus-like under such circumstances. Now that antiseptic treatment had reduced in great measure the risk of fever, such an argument had

less weight. Not if there was any truth in it—it should not be altogether overlooked in considering the risks of the operation—as it carried them beyond the mere operation itself into the larger stages of convalescence.

Dr. MARCET related particulars of the case of a dog from which the spleen had been removed about thirty years ago; the animal had subsequently lived many months, without apparently being in the least degree altered by the operation. It had then died from another cause altogether.

Mr. LISTER thought it most unfortunate that Mr. Haward's case had been fatal. Death had apparently resulted from the shock, although ether, not chloroform, had been given. The case was discouraging, as it was one favourable for the operation, and no hemorrhage had followed. Ligature of the splenic artery would be a dangerous proceeding. Experiments should perhaps be performed on the lower animals, to see if the spleen could live after ligature of its main artery, and if animals afflicted with leucocythæmia were cured by the removal of the spleen.

Mr. HAWARD said it was not at first suspected that the patient had leucocythæmia, although she had a large spleen. It was true that, in Mr. Collier's tables, the mortality after splenectomy in leucocythæmia was very great; but in this case there was no evidence of blood-change in the direction of leucocythæmia beyond that given by the microscope. The cause of death was not due to hemorrhage. The spleen was easily torn; and, at the rent which occurred in its substance during the operation, the hemorrhage was quite momentary, and no great amount of blood was lost. There was no oozing from the abdominal wall, and no difficulty in arresting the hemorrhage. Ligature of the splenic artery would be a very difficult operation if the spleen were much enlarged. Perhaps in future operations a clamp might be placed around the vessels, the spleen removed, and the vessels subsequently tied. The spleen had been removed in many cases, and the patients had recovered; so that the spleen did not appear to be a very essential part of the human economy. But, if there were an early stage of leucocythæmia, it came to be a question whether the operation should be attempted. Dr. Goodhart's remark as to the feeble clotting power of the blood after death from leucocythæmia should be remembered.—*Med. Times and Gazette*, April 8, 1882.

Nephrectomy for Scrofulous Kidney.

At the meeting of the Clinical Society of London, held March 24th, Dr. GOODHART and Mr. GOLDING-BIRD read joint notes of this case, which was that of a young man who had suffered from symptoms of renal affection for fifteen months prior to his first coming under observation. His emaciated state and general cachectic condition, combined with the pyuria and right lumbar pain from which he suffered, pointed at once to a scrofulous pyelitis on the right side. All the other viscera were healthy. Combined abdominal and lumbar palpation, on the right side, proved the presence of an elastic tumour at the site of the kidney that was tender, and was found, on watching, to vary in size inversely as the bulk of the pus passed in the urine. After due consideration, it was agreed upon by the authors that active steps should be taken to afford relief: these reasons being founded upon the almost universal tendency of these cases rapidly to end fatally; the proved inefficiency of medicines to arrest the progress of the disease; the fact that the disease was at first at least local; and that it was only later on that other organs became infected and diseased. It was further agreed that, in the patient's present condition, anything palliative, even in the way of tapping the swelling, would be but loss of time, and making demands on his strength to no purpose. Nephrectomy was therefore decided upon and performed; the whole of the kidney

was removed, after tapping it, through the wound, in order first to diminish its bulk. It weighed ten ounces, and was a characteristic specimen of serofulous kidney. Soon after the operation, extreme collapse supervened, from which the patient never rallied. At the inspection, the right urinary organs and the bladder were the only parts diseased; the latter, however, not irrecoverably so. While the gravity of the operation alone might account for the death, yet it was noticed that the pulse did not fail during the operation, neither on the necessary manipulation of the suprarenal bodies, nor at ligature of the pedicle. The collapse supervened at once on returning the patient to bed; and the possibility of the carbolic acid of the spray being absorbed by so large a raw surface, and in such close proximity to the large lymphatic sac (or peritoneal cavity), was suggested in explanation of the fatal ending to the case.

MR. CLEMENT LUCAS considered that the operation, at which he was present, had been most carefully performed, and he thought the incision was the best for the case. He alluded to a case in which he had opened the kidney six years before the performance of nephrectomy, and there had been a discharge from the loin for all those years. He thought the ureter should be first tied, and cut through, and then the vessels could be the more easily ligatured. There had been a subcutaneous injection of morphia after the operation, which he thought might possibly have added to the patient's collapse. After operations for hernia, where morphia had been injected, he had seen two cases of collapse and death; so that he never now gave a morphia suppository after such operations until the patient had quite recovered from the chloroform. In his case of successful nephrectomy, the man was now well, and his wife had borne a child since the operation. Pus had continued to be passed in the urine for months after the operation, and had then gradually disappeared.

MR. GODLEE said the pleura went down to, and even below the last rib; so that he considered the removal of a part of that bone a very serious operation. He presumed the tuberculous mass in the prostate might have been previously felt. It seemed to him that the operation was defective, inasmuch as it contemplated the removal of only a portion of a wide-spread tubercular disease.

MR. MORRANT BAKER said that in a case of the kind under his care he had at first opened down to the kidney only, hoping the organ would dwindle; but it did not diminish after several weeks' waiting, and the subsequent operation was only rendered the more difficult, as the tissues around the kidney had meanwhile become much matted together. The first operation seemed, in fact, to have been useless. He had since seen the child, as she was ill. She was feverish, and had afterwards died; but the wound in the loin had quite healed some months before. The urine passed a few days before death had not been distinguishable from healthy urine. Perhaps, if she had had two kidneys, to remove effectually the products of the feverish attack, she might have also recovered from the illness which proved fatal. He desired to ask the President his opinion as to whether the exposure of such a large surface for nearly two hours to the carbolic spray added to the danger of a fatal collapse.

MR. T. SMITH said he had never seen a case in which, if one kidney were tuberculously diseased, the other kidney and other parts of the urinary tract were free from disease. At any rate, after nephrectomy for tuberculous kidney, a portion of ureter similarly diseased would be left.

MR. KNOWSLEY THORNTON had had a tolerably large experience in operations on the kidney; he had performed lumbar nephrotomy three times, and abdominal nephrectomy three times, and all the patients had recovered. He was thus in a position to speak from experience as to each method, and he had no hesitation in giving the preference to the abdominal section, by incision outside the rectus

abdominis, instead of in the median line. This was advocated by Langenbeck, of Berlin, at the Congress, and Mr. Thornton had found it most satisfactory. There was even less hemorrhage from the parietes than in the median incision; there was little or no exposure of the general peritoneal cavity, the renal vessels could be reached and ligatured before the kidney was enucleated, and much hemorrhage thus saved; and there was much less hemorrhage in enucleating through the outer layer of the meso-colon, than through the inner layer, where most of the vessels lay. He had twice operated by this incision during the last few weeks, and both patients had recovered with but little fever; indeed, convalescence was almost as rapid as after an ordinary ovariectomy. He had brought out the end of the ureter in each case, and fixed it in the wound; and this he regarded as important in avoiding sepsis. He had in one of the cases previously performed lumbar nephrotomy, hoping to cure by free drainage, but the only result was to increase the difficulty of the after nephrectomy, as in Mr. Morratt Baker's case; and he could not at all agree with Dr. Goodhart as to the advisability of making nephrotomy an introduction to nephrectomy. He had, however, found it possible to destroy the existing sepsis by the free use of tincture of iodine. In his last case the kidney weighed four pounds seven ounces, and contained twenty pints of pus, and it would have been quite impossible to perform the operation through the loin. From a careful consideration of the published cases, and from his own experience, he would strongly advocate Langenbeck's incision *in all cases*, and he believed that, with experience and care, the operation, though performed through two layers of peritoneum, might be made practically an extraperitoneal procedure, the peritoneum being closed immediately the opening for enucleation being obtained. In reply to Mr. Morratt Baker, he might mention that he had had several cases of abdominal operative surgery, under the carbolic spray, lasting two, or nearly three hours, and that he considered the chance of danger from the spray was very little indeed.

Dr. BARLOW said that, in a case operated on by Mr. Couper, the patient, a girl, was in good health several months after the operation. In her case the pyelitis, as in many other instances known to him, had been located in one kidney only.

Mr. BARKER said that, as to the removal of the last rib, in one case where the end of the rib was resected, the patient became cyanosed, with all the symptoms of a collapsed lung, and had died. In another case, operated upon by himself, he had unintentionally removed the end of the last rib in cutting down upon the kidney; no ill result had followed.

Mr. REEVES said that, although he had never had occasion to do nephrectomy, he had cut down on the kidney for exploratory purposes, and had seen nephrotomy and excision of the organ in three or four instances. The incision adopted was the usual oblique one as for lumbar colotomy, but nearer the rib. If more room were needed, this incision might be increased, or one at an angle to it added. He thought that intraperiosteal excision of a portion of the last rib was justifiable in cases where the organ could not be extracted without it, but he quoted a case in which a large kidney was removed by pulling up the last rib, and thus getting an inch to an inch and a half more room. This mobility of the last rib should be utilized as much as possible before proceeding to the somewhat severe measure of excising a part of it. There were some cases of cystic kidney, which could not be removed by the lumbar or extraperitoneal method; and he had recently assisted at such a case, which, before and during the operation, had closely simulated an ovarian tumour, so as to deceive experienced ovariectomists. Had it been attempted to remove this through the loin, the operation would either have failed, or only been concluded with serious and unsurgical damage to the peritoneum.

He, therefore, thought that large cystic kidneys should be removed by the intra-peritoneal method, although two layers of peritoneum were incised, as nowadays there was little risk in properly selected abdominal operations.

Mr. LISTER said he was pleased to hear that the means adopted by Mr. Thornton to render the wounds aseptic by the free use of tincture of iodine were efficacious. He had recently seen a lady, aged 24, sinking, with pus in the urine, in whom it was doubtful as to whether there was a calculous or scrofulous kidney. Under chloroform, the kidney was felt to be large. Upon puncture of the organ, pus escaped; no calculi were discovered. The wound in the kidney-substance was enlarged, and cavities were detected, from which four or five ounces of pus escaped. Two large drainage tubes were introduced; the wound was sewed up, and covered with eucalyptus gauze. It might be asked why was this done? Because, in some such cases, after the letting out of such offensive pus, the next day only a serous oozing would occur, although bacteria might have been present when the pus was first discharged. Antiseptic treatment answered its purpose completely in such cases. That patient was now recovering; the discharge was lessening, and the wound was healed. Even if the kidney had proved to be tuberculous, and had had eventually to be removed, his patient could not at that time have survived the major operation of nephrectomy. He had never known the carbolic spray injure the patient, although used during a long abdominal operation.

Dr. GOODHART said that, as to the question of the removal of a part only of the disease, he believed the disease commenced in one kidney, then went to the bladder, and up the other ureter to the other kidney, which, after a year or two, became diseased. He did not think that it was an argument against the operation that the suppuration in the urine lasted afterwards, for it very soon diminished, and then ceased entirely.

Mr. GOLDING-BIRD said the patient was collapsed before he was put to bed, and did not die from the morphia, as he had quite roused. Neither did he think the pleura could have been hurt in any way. He thought each case must be decided on its own merits, so far as the question of nephrotomy or nephrectomy was concerned.—*British Medical Journal*, April 8, 1882.

Unsuccessful Nephrectomy for Calculous Pyelitis.

Dr. BARLOW and Mr. GODLEE read notes of this case at the meeting of the Clinical Society of London, held April 14th. The patient was a laundress, aged 57, of somewhat intemperate habits, who came under Dr. Barlow's care in June, 1881. Her family history presented no feature of interest; and though she recollected, on being carefully questioned, that she had passed a small calculus twenty-six years previously, she maintained that the present illness dated only from three months previously. She suffered now a considerable amount of pain, which prevented her from moving about, and had at one time a good deal of œdema—of the right leg especially—which subsequently disappeared. The urine contained a large quantity of pus; it was in fair amount, but not much more than about two-thirds of the normal quantity of urea was secreted in the twenty-four hours. The kidney was easily felt, forming a large tumour in the hypochondriac region. The woman was somewhat anæmic, and had a slight cardiac murmur, but was otherwise in good health. The amount of pain, and the quantity of pus in the urine, seemed to justify the authors in suggesting the operation to the patient—though not on pressing it—notwithstanding her comparatively advanced age; and, after due consideration, she consented to its performance. The existence of calculus had been previously ascertained by puncturing the kidney with

the needle of an aspirator. The operation was performed, with all antiseptic precautions, by Mr. Godlee on July 14th, that chosen being the abdominal section. It presented great difficulty from the density of the structures round the kidney, but was satisfactorily accomplished, the patient at the time suffering remarkably little from shock. A morphia suppository was at once administered, and some tincture of opium was given by the bowel later in the day. The patient appeared to be progressing favourably for the first twelve hours, and then passed into a quiet sleep. When aroused next morning it was found that the temperature was high; that little or no urine was being secreted; that the respirations were becoming very hollow; and that the patient was in a state of semi-consciousness. From this condition she did not recover, but she died about twenty-four hours after the operation. At the necropsy, the left kidney and the other viscera were found to be practically healthy. It was suggested that the amount of morphia administered had something to do with the patient's death, and that possibly the carbolic acid absorbed during the operation might have helped to this result; though, doubtless, the suppression of urine, from whatever cause it arose, was the most important factor. The parts removed, and half the kidney of the opposite side, were shown at the meeting.—*Brit. Med. Journ.*, April 22, 1882.

Nephrectomy.

In a lecture on this subject, delivered at the Samaritan Free Hospital, on April 19th, Mr. J. KNOWSLEY THORNTON mentions a proceeding which he believes he was the first to introduce, and which he considers to be of the greatest consequence to the safety of the patient and to the aseptic performance of the operation. He refers to the fixing of the bladder end of the ureter outside the abdominal incision, so that the septic material it is certain to contain is not left deep in the recesses of the wound. He tied it as firmly as possible with strong silk, and cut it off so as to leave only just enough stump to pass a pin through and keep it from slipping into the wound. He cleaned this stump well with iodine, and packed it round with a little cotton squeezed out of tincture of iodine. By this method he has been able to avoid putrefaction in the early stages of the case, *i. e.*, until the peritoneum is well sealed. He thinks the question of drainage in these operations must be decided at the time for each individual case. Whenever there is a loin opening, as in his first case, he should certainly use it, passing an India-rubber tube right through from the abdominal incision (as he did in that case), so that the wound could be at once flushed and washed out if any septic symptoms appeared. In any case in which he felt sure of asepsis, he should not drain, as he was sure the peritoneal surfaces about the wound would rapidly remove (absorb) fluid effused, as was the case in one of his cases.

To sum up, then, he would recommend that the lumbar incision be only used for cases in which there is strong suspicion that a calculus is present, and that the operation will end in nephro-lithotomy; and he should be disposed, in any case in which he had commenced by the lumbar incision, and then found it necessary to complete the nephrectomy, to do so by Langenbuch's incision, utilizing a portion of the already made lumbar incision for drainage, and closing the remainder. He would in all other cases, such as neoplasm of kidney, hydronephrosis, pyonephrosis, and floating kidney, operate by abdominal section, making the incision along the outer border of the rectus abdominis instead of in the median line.—*Med. Times and Gaz.*, May 6, 1882.

Nephrectomy for Hemorrhagic Cyst of Left Kidney.

Dr. G. LEOPOLD reports the following case (*Arch. f. Gynäköl.*, xix., No. 1): Mrs. A., aged thirty-three years, married ten years, one child. Six years previously noticed a swelling on the left side of the abdomen, which increased rapidly during last two years. *Status præsens*.—The abdomen is completely occupied by a tumour extending up to lower border of the ribs; flatness on percussion everywhere but on circumference of tumour where it is tympanitic; the tumour is slightly movable from left to right, not at all from below upward. Digital examination revealed a retroverted hypertrophic uterus. Diagnosis: ovarian cyst. Laparotomy was performed, exposing a fluctuating tumour as large as a man's head, from which, when it was punctured, flowed about four quarts of a thick blood-red fluid. A prolongation of the capsule extended upward and backward and to the left, and was found to be in intimate connection with the left kidney, the lower end of which terminated in the tumour like a chalice. The hilus was then drawn forward and the vessels and ureter ligated in three portions, and, to prevent slipping of the ligatures, the kidney was removed in such a manner that a triangular piece of its parenchyma was left attached to the hilus. The whole was returned to the abdominal cavity, which was accurately and completely closed. Lister dressing. No drainage. Removal of dressing and sutures on eighth day. No reaction whatever. Discharged cured at the end of third week. Observations of urinary secretion showed it to be below the normal in quantity until the fourteenth day. No other change was noticed. Microscopical examination of the kidney showed its parenchyma to be entirely healthy, except at the lower end, where it terminated abruptly in a strong connective-tissue capsule, which was continuous with that of the tumour. The source of the hemorrhage could not be discovered. In this case our means for the diagnosis of abdominal tumours proved to be quite insufficient. Spencer Wells gives the following as the most important points: Ovarian tumours are usually situated in front of the intestines, renal behind. Tumours of the left kidney are usually traversed vertically by the descending colon. A tumour of the kidney is always first found between false ribs and the ileum, grows at first in the direction of the umbilicus and thence into the hypochondrium, while ovarian tumours grow from below upward. Now these points may be very valuable where the tumours concerned are small, but are utterly unreliable in cases of large renal tumours. According to Olshausen, the latter occupy the entire abdominal cavity, so that it is impossible to trace their lateral origin. Immobility proves nothing, since large ovarian cysts are also immovable. Olshausen recommends the following: An asymmetric position of the tumour leaving a certain space on one side and the above-mentioned relation to the colon. But these also are of little value, for, as in this case, a large fluctuating tumour occupying an exactly central position, resting upon the pelvis in such a manner as to crowd the uterus backward, which could not be crowded upward, and was surrounded by intestine on all sides, all of these data perfectly justified the diagnosis of ovarian cyst, and even aspiration would have revealed little or nothing.

Since Kroner's computation, thirty-four new cases of nephrectomy have been reported; fifteen by abdominal, nineteen by lumbar incision. We have, therefore, seventy-six cases with the following results: thirty-eight by abdominal incision, twenty-two deaths, fifteen recoveries (result in one unknown); thirty-eight by lumbar incision, thirteen deaths, twenty-four recoveries (one not accounted for), so that the results from both methods are in inverse ratio to each other.—*American Journal of Obstetrics*, May, 1882.

Partial Extirpation of the Kidney for Pyelitis.

Mr. HOWARD MARSH read notes of this case at the meeting of the Clinical Society of London, held April 14th. The patient, a blacksmith, aged 35, was admitted into St. Bartholomew's Hospital in October last. He had had severe pain in the right loin for three years, and for eighteen months the urine had been ammoniacal and had deposited a light-coloured sediment. He had never observed blood. On admission he was pale, and his countenance was worn and anxious. The urine showed pus equal to a third of its bulk on standing, and also a small amount of blood; it was highly ammoniacal and very fetid. The patient complained of pain shooting down from the right kidney in the course of the ureter to the testis. There was some tenderness on pressure over the kidney, but nothing abnormal could be felt either in the groin or anteriorly. There was no stricture of the urethra, and no stone in the bladder. The patient was kept in bed, and in order to ascertain whether his symptoms depended on any bladder-disease complicating the mischief in the right kidney, the bladder was injected every morning, for ten days, with one grain of quinine dissolved in an ounce of slightly acidulated water, and subsequently with water gradually raised to a temperature of 120°. He was also put on a pure milk diet. But none of these methods improved the condition of the urine. At the end of two months, as he was still passing large quantities of fetid pus, the kidney was explored through an incision extending downwards and forwards from the last rib to the crest of the ilium. It was found greatly enlarged, sacculated, and very firmly bound down by dense inflammatory tissue. On stripping off its capsule—a matter of considerable difficulty—and puncturing its cortical substance, a large quantity of thick and strong-smelling urine escaped. As the whole kidney was evidently disorganized, an attempt was made to remove it, but it was so firmly adherent that this could not be accomplished. What had been exposed was, therefore, included in a double ligature and removed by curved scissors. No hemorrhage of any moment occurred during the operation, but the patient died in thirty hours of complete suppression of urine. On post-mortem examination, the right kidney was found converted into a number of large cysts. Three inches below its commencement, the ureter was so narrowed that its canal would only admit an ordinary probe. Above this point it was considerably dilated. These conditions seemed to have been produced by the healing of an ulcer in the ureter, perhaps of a tubercular character. The left kidney had the appearance of being fairly healthy; it weighed six ounces. The author remarked that he was induced to resort to an operation in this case—though, in consequence of the patient's general condition, he did so very unwillingly—in the hope of doing good either by extracting a stone, or by establishing free drainage, or of removing the kidney if it proved to be extensively diseased. It might be a warning for future cases that the condition of the kidney was much worse than there seemed reason to anticipate. Though it could not be felt during careful examination under ether, it was very large; it was so far destroyed that very little renal structure remained; and it was so firmly adherent that its removal was found to be impracticable. Seeing how limited was the space afforded by the incision in the loin, the author thought that experience was likely to show that the best method of removing large kidneys, or kidneys that were bound down by firm adhesions, was by abdominal section, the incision being made just external to the rectus muscle. He concluded by remarking that, though recent cases showed that the kidney might be safely explored by the lumbar incision, and though calculi of small size might be safely extracted from kidneys that were structurally healthy, further experience alone could teach in what cases the kidney might be safely removed. One point

must be carefully borne in mind—namely, the liability to suppression of urine from the opposite kidney. He thought the removal of kidney in persons over thirty years of age was, on this account, one of the most dangerous proceedings in the whole range of legitimate operative surgery.—*Brit. Med. Journ.*, April 22, 1882.

Nephrotomy.

During the early part of March nephrotomy was successfully performed by Dr. RODDICK, of the Montreal General Hospital, upon a girl of twenty, who had for six years been suffering from frequent and painful micturition, the urine voided being small in quantity, and more or less muco-purulent and bloody. At twelve years of age the patient had an attack of so-called *spinal fever* (?), at fourteen a severe sciatica, and shortly afterwards her urinary troubles began. Most of the ordinary methods of treatment were tried without much benefit; an examination was made for calculus, with negative results; rapid dilatation of the urethra was practised, several small villousities were removed from the mucous surface of the bladder, and weak nitric acid injections employed, but without any marked or permanent relief. Meanwhile, in spite of constant and careful treatment, the urine became gradually more purulent, and the patient's general health steadily declined. Last July chills and fever set in, accompanied by vomiting, alternating constipation and diarrhoea, and pain over the right kidney with tenderness upon pressure. By October a well-defined tumour could be made out in the right hypochondrium—a hypodermic needle was inserted, but failed to reach pus. From that time her decline was rapid, and although the appetite kept uniformly good, emaciation became extreme. On admission to hospital, a distinct fluctuating tumour was found occupying the right hypochondriac and lumbar regions. The urine, which was passed every half hour, was scanty, and contained mucus and pus in abundance.

The presence of pus in the tumour having been discovered by means of the aspirator, nephrotomy was performed with strict antiseptic precautions. A transverse incision was made in the loin, midway between the border of the ribs and the crest of the ilium, and about twenty ounces of putrid, foul-smelling pus with a urinous odour came away; the sac was secured to the edges of the wound with silk sutures. A careful digital examination revealed extensive disease of the kidney structure, but no concretions. The cavity was thoroughly washed out with a carbolic solution (1 × 40), a large-sized drainage tube inserted, and antiseptic dressings applied. On the third day symptoms of carbolic acid absorption having appeared, a twenty per cent. boracic acid solution was substituted. The operation has so far proved a complete success: the chills and fever have disappeared—the urine has increased in quantity, is passed painlessly, and at longer intervals. The strength and general condition of the patient improved so rapidly after the operation, that on the sixteenth day she was able to be removed to her own home.—*Canada Med. Record*, April, 1882.

Nephro-lithotomy on Account of Anuria.

The following interesting case (*Centralblatt für Chirurgie*, March 25) illustrates the soundness of the rule, which advises against extirpation of the kidney when the organ is otherwise healthy and a calculus is found in it. It appears probable that those causes which lead to the formation of stone in the kidney act upon both kidneys alike, and the removal of one exposes the patient to all the dangers which might result from the formation of a calculus in the other.

The patient was an unmarried lady, 27 years of age. She had suffered for ten

years with violent cramp-like pains during urination, radiating occasionally into the left side. Urine dark, of neutral or slight acid reaction. Dilatation of the urethra, with incisions into the sphincter vesicæ, was performed on the 13th of October, 1881. This was followed by cystitis and subsequently by a retro-peritoneal abscess, which latter was, by introducing the finger into the abscess cavity, found to be an abscess of the pelvis of the left kidney.

The daily rise of temperature had not taken place any more until February 8, 1882, when the thermometer registered 38.1° C. in the morning. No discharge of urine. Afternoon temperature 40.4° . Rigor. Catheterization was performed, but no urine, only mucus and a small stone being drawn. Pains in the right lumbar region radiating toward the bladder. The following diagnosis was made: complete obliteration of the left kidney by the abscess and momentary closure of the right ureter by a calculus resulting in complete anuria.

Evening temperature 38.4° . Nausea. Anuria.

Feb. 9. Morning temperature, 39.1° . Noon, 39.5° ; evening, 39.4° . Constant nausea, with tendency to vomiting. Vomited gall-coloured mucus twice. Pain in the right lumbar region radiating toward the bladder; no urine; no convulsions. Uræmia began to set in, and it was determined, in order to avoid imminent death, to search for and remove the calculus.

An incision was made in the lumbar region from the end of the 11th rib to the crest of the ilium, and the muscles and deep fascia were divided until the fatty capsule of the kidney was reached. Then a second vertical incision was made from the lower end of the first, on a level with the crest of the ilium and extending backward. The capsule of the kidney was then divided, and it would have been an easy matter to remove the kidney, which could not, however, for obvious reasons, be done. In order to reach the pelvis of the kidney and the ureter, the anterior surface of the kidney was freed from the capsule, and the stone which obstructed the ureter was felt to glide back into the pelvis; at the same time urine followed from the bladder. The calculus was then removed by being again forced into the ureter and the latter cut open over it. The stone was smooth, elongated, and about the size of a pea. Four other calculi were detected in the pelvis of the kidney and extracted. The wound of the ureter was sewed up by means of three silk sutures, the ends of which were left to hang out of the external wound.

10th. Morning, temperature 36.6° , pulse small and frequent. The dressings are saturated with urine. Noon, temperature 38.0° . No urine per vesicam but has passed through wound. Some nausea, but less than yesterday. Evening, temperature 38.5° .

11th. Temp., morning, 38.1° . Evening, 38.3° , a little stronger; nausea continues.

12th. Temp., morning, 37.6° . Evening, 38.3° . Urine escapes through wound.

13th. Rigor during the night 40.8° . No urine in the dressing. The sutures of the ureter are cut, as is the ureter, and the latter was fixed in the lumbar wound by means of sutures. The patient was still alive on the 12th of March, and the wound, which for some days did not look well, presented a clean appearance.

The condition, as detailed, is no doubt rare; but even in those cases in which a ureter is plugged by a calculus, even though the other kidney performed its function, and the urine from it flows into the bladder, it is advisable to perform nephro-lithotomy in order to save the other kidney.—*St. Louis Med. and Surg. Journ.*, May, 1882.

Floating Kidney.

A careful and learned study of "Floating Kidney," a subject of great general interest, has lately appeared from the pen of Dr. LEOPOLD LANDAU.¹ The frequency with which "so-called movable kidneys" are observed in the living subject, and the rarity with which they are seen in the dead-house, have induced some to question their reality; while personal experience of one or more cases in which they have led to more or less serious symptoms has lately induced others to advise their removal on small provocation. The frequency of their occurrence in women is a point which certainly requires explanation. All the bearings on this subject are dealt with in a treatise of some hundred pages.

In discussing the mechanism of the displacement, the author considers the normal fixation of the kidney, and lays much stress on the intra-abdominal relations of pressure, pointing out the interesting fact that, although the kidneys generally remain *in situ* on opening the abdomen, and raising the body upright, by means of their attachments, in some cases they become more or less dislocated, as was pointed out by Sappey. The cases in which diagnosis of a movable kidney during life has been followed by a *post-mortem* discovery of the kidneys *in situ* by no means disprove the correctness of the diagnosis, considering that the kidney, which can during life be pushed into its normal place, may sink there in the recumbent position after death, and become fixed by the setting of the fat round it. Seventeen autopsies of dislocated kidneys are given. The etiology is to be found by referring to the forces which normally fix the kidney; these are two in number: the arrangement of the attachments of the kidney and the intra-abdominal relations of pressure. Whatever disturbs either of these favours dislocation. The commonest of these predisposing causes are emaciation, abscess in the neighbourhood, and loss of firmness and elasticity in the abdominal walls. The exciting causes may be jerks or the traction of viscera (especially the colon) in a belly more or less pendulous; but we cannot follow the author in including such firm pressure as bearing down of all sorts. The connection of hydronephrosis with movable kidney is obvious, and is borne out by numerous facts; the connection of hydronephrosis with pelvic tumours, with pelvic cicatrices, and with procidentia uteri has been observed, but our author includes flexions of the non-pregnant uterus, and refers to two cases, which, he says, "convincingly prove" this. We have referred to one of these, and find ourselves less convinced than before, the case not having furnished an autopsy, and the relation of one condition to the other being based upon pure theorizing. The other we cannot find in the medical libraries of London.

Dr. Landau discusses the corset and acquits this popular scapegoat. With regard to the frequency of right-sided affection, he finds the explanation of this in the firmer attachments of the left kidney, which are considered principally in connection with those of the colon, but also of the duodenum and pancreas. The symptoms are regarded from the point of view of the nervous, vascular, digestive, and urinary systems. Under the first the increased pain in movable kidneys at the menstrual period is brought into relation with the "aching kidney" of Duncan. A remark is made, which seems to us wise and most pregnant, with regard to all alleged mutual pressures of neighbouring organs, a force constantly invoked for the explanation of pelvic symptoms, that the kidney has not *weight* but *specific gravity*, an expression to be understood, of course, not with reference to water but to the intra-abdominal pressure, and to be remembered in the case of all internal organs. The phenomena of strangulation ("Einklemmungserschei-

¹ Die Wanderniere der Frauen, von Dr. Leopold Landau. Berlin, Hirschwald, 1881.

nungen'') in a floating kidney meet with the attention they deserve. The German name has not, to our knowledge, an exact English equivalent in use. The symptoms usually follow exertion or quick movement, and consist of severe pain, collapse, vomiting, high-coloured and scanty urine, sometimes containing blood, some fever, together with the rapid growth of a large dull tumour in the region of the floating kidney. The symptoms increase in from four to six days, the tumour disappearing in one or two weeks. The first sign of recovery is the plentiful secretion of urine of low specific gravity. These phenomena are referred by the author to torsion, or angular flexion of the renal vessels, especially the renal vein; and this view is illustrated by diagrams of actual experiments. The favourable termination of these cases is explained by the fact that, even if the torsion or angular flexion is not obliterated, a collateral circulation is established, even after ligature of the renal vein. This view is supported by a *post-mortem* observation by Mosler. It covers the connection between movable kidney and hydronephrosis, either temporary or permanent, a connection supported by facts. It can be easily understood how obstruction by flexion of the ureter may be relieved by the supine decubitus, especially if tension be diminished by aspiration. The author lays stress on the untrustworthiness of percussion in the diagnosis of movable kidneys, and gives cases where no difference could be detected between the two sides, even after excision of a kidney; a remark of Skoda's, that resistance rather than resonance is to be relied on in percussing the kidney, points in the same direction. The author ventures to assert that auscultation will detect a whistling murmur in cases of torsion of the vessels, a supposition which the analogy of ovarian tumour with twisted pedicle does not as yet confirm. A floating kidney not very uncommonly disappears permanently, in other words becomes fixed again. It is easily intelligible that if emaciation (especially where rapid) and relaxation of the abdominal walls can produce luxation (as happens sometimes after childbirth), rest in the supine position, together with the production of fat, may fix the kidney in its place again. The author's experience leads him to disapprove of all special contrivances for keeping the kidney in position, and to prefer a good broad bandage, but especially the much-abused "swan-bill corset!" All such contrivances, of course, can only be palliative. With regard to the proposed extirpation of uncomplicated floating kidneys, the author makes a remark whose scope is by no means limited to this affection: "The fact that a patient, immediately after extirpation of a floating kidney, feels better and suffers no inconvenience from the floating kidney is no more astonishing than that a woman no longer suffers from menorrhagia after removal of the healthy ovaries or uterus. . . . The amputation of a normal cervix uteri or the removal of healthy ovaries, perhaps the cause of dysmenorrhœa or some other slight suffering, is not to be justified; how much more unjustifiable is the extirpation of an organ so essential to life as the kidney?" In discussing the treatment of hydronephrosis the author prefers the establishment of a fistula to extirpation, on the sensible ground that, apart from the increased risk of the latter operation, the discharge from the fistula is found to become more and more urinous, proving the partial recovery of function by the remainder. Besides, even if we are sure that the other kidney is healthy, experience shows that two kidneys are not one too many for an individual, and that many would be glad of a larger allowance. Eight personal observations are given of the greatest interest, for which we must refer our readers to the original, only here remarking that in two cases pressure on a right kidney caused pain in the *left* lumbar region, an observation very instructive to the gynecologist, who often finds the same phenomena in connection with the ovaries. The paper ends with a list of 45 cases, from which, on analysis, we find that 11, or about 25 per cent., had pen-

dulous belly; 6, or about 13 per cent., had descent of uterus or vagina; 3, or about 7 per cent., had hernia; and 7, or about 15 per cent., had "retroflexion" of the uterus. Displacements of the uterus are frequently mentioned by the author, but he never uses any word but "retroflexion." If these proved to be cases of retroversion with descent, with or without retroflexion, all the above women, twenty-five in all, or more than 55 per cent., suffered from diseases associated with disturbance of the intra-abdominal relations of pressure—a most pregnant fact.—*Lancet*, April 22, 1882.

Floating Kidney in the Female.

There is a great diversity of opinion as to the pathological importance and therapeutic indications of floating kidney. The majority of clinicians regard them as anatomical curiosities, and of no clinical moment; lately, however, KEPPLER claims that a floating kidney is a continual menace to the life of the patient, and that the danger should be removed, as soon as detected, by the extirpation of the organ. Landau, in his work on this subject, gives us an analysis of forty-five cases, and arrives at conclusions opposed to those generally held. He believes, with great probability, that a movable kidney often escapes detection, or may be wrongly interpreted. It occurs generally in women between the ages of 30 and 40 years, from special predisposing causes, or from displacement by tumours, rapid diminution of fat in acute diseases, or relaxation of the abdominal walls after gestation. Habitual constipation may also be an exciting cause of displacement of the kidney, or the downward displacement of all the abdominal viscera from tight lacing may drag the kidney from its normal position. Among other exciting causes are mentioned prolapse of the genital organs, hydronephrosis and abnormal laxity of the perinephritic tissues.

Instead of explaining the symptoms as due to torsion of the renal vessels, and a consequent disturbance of the renal circulation, Landau believes that they are dependent on the varying facilities of excretion depending upon the different degrees of torsion or flexion of the ureters.

This is the most satisfactory explanation of the colicky pains and hydronephrosis often accompanying movable kidneys. Palpation furnishes the most reliable means of arriving at a diagnosis. Landau believes that a movable kidney in no way threatens life, and that as spontaneous cures often occur, nephrectomy is not a justifiable operation, especially since of the six cases, thus operated on up to the end of 1880, three were fatal.

In order to render the kidney immovable, Landau employs a corset descending to the pubes, and electricity, massage, and sea-baths to increase the tone of the abdominal walls. Complications are not regarded by Landau as generally fatal, and he only recommends expectant treatment.—*Journ. de Méd. de Paris*, April 1, 1882.

Palpation of Vesical Calculi in Children.

In No. 11 of *Centralblatt für Chirurgie*, RICHARD VOLKMAN contributes the following concerning the diagnostic value of rectal examinations in cases of vesical calculi in children:—

The value of a rectal bimanual examination in children suffering from stone in the bladder is recognized by all. The examination is made whilst the patient is thoroughly under the influence of an anæsthetic, with complete relaxation of the abdominal parietes and the bladder but slightly distended or empty. Two fingers of the left hand are carried as high up into the rectum as possible; the right hand presses upon the abdomen above the symphysis and forces the bladder

downward toward the rectum until both hands meet. In children the whole bladder can be palpated by this method, and even small calculi are readily detected. It requires considerable practice and experience, however, to determine the size of the stone, although it can be distinctly felt and moved about between the fingers of both hands, and at first he was often deceived concerning the size of the calculus; usually he considered the stone smaller than it proved to be after being extracted.

Of late, he has found, however, that there exists a yet more certain method to determine the size of a calculus in children by direct palpation. By means of the fingers of the left hand, which have been introduced into the rectum, and guided by the right hand which rests upon the abdomen the stone is lifted upon the os pubis and held there. It is an easy matter then to completely encompass it, and to allow those about to handle it. If the calculus is not too large, it is possible to raise it, together with the skin of the groin, so high as to tie it with an elastic ligature. He does not mention this, however, to suggest the elastic ligature as a method of removing vesical calculi, but because it may be possible to utilize it in such movable tumours of the bladder as are observed in pediculated papillomata and myomata.

In the last four cases of stone in children which came under his observation he succeeded very readily and without exception in dislocating the calculus upon the os pubis and in encompassing it with his fingers. The last stone which he palpated in this manner was as large as a chestnut.

In adults this manipulation can, of course, be performed only in spare subjects with thin abdominal walls.—*St. Louis Med. and Surg. Journ.*, May, 1882.

Tumour of the Bladder in the Male successfully removed through Perineal Section.

At a meeting of the Royal Medical and Chirurgical Society, held April 11th, Sir HENRY THOMPSON reported the following case: Thomas R., aged 29, consulted Sir H. Thompson on July 26, 1880. Eight years previously he had passed "a piece of gravel of the size of a pea." After this he felt nothing unusual until 1877, when his micturition became more frequent, and was followed by pain in the end of the penis; also, occasionally, blood appeared in the urine, especially after exercise. The patient was sounded, and a small calculus was found. On August 5th, Mr. Bailey gave ether, and Mr. Furber, who had seen R. previously, was present at the operation. It was a small oxalate of lime calculus, and was easily crushed and removed. Very little improvement followed the operation. The bladder was not quite emptied by the natural efforts; the gum catheter was used daily, and on two occasions gave signs of the presence of something in the bladder, which a subsequent exploration with the lithotrite did not discover. Being relieved, he resumed his employment, and was occasionally seen relative to the still existing slight symptoms, which gradually increased. On October 5th, Sir H. Thompson examined the bladder, and removed a quantity of phosphatic deposit with the lithotrite. He then seized what at first felt like a calculus, and partially crushed it under pressure; but it was evidently fixed, giving an impression of partially impacted stone. More phosphatic matter being washed out, it was decided to watch the result for a short time, and to open the bladder if necessary. Accordingly, as after three weeks he had received very little benefit from the last operation, Sir Henry cut, as in median lithotomy, on the 6th November, 1880. Professor Paggi, of Florence; Dr. Seegen, of Vienna; and Mr. Ceely, of Aylesbury, were present. Having introduced his finger well into the bladder, and pressure being made above the pubes, Sir H. Thompson recog-

nized a tumour, about the size of a chestnut, growing apparently from the opposite wall or fundus, and somewhat to the patient's left, coated with phosphatic matter, and evidently the fixed body he had formerly seized with the lithotrite, and denuded of its sabulous covering. Taking a pair of small forceps, he adjusted them to a full and firm hold, and then twisted off the mass without difficulty; a small piece or two were subsequently withdrawn, but the tumour appeared to be entirely removed, and very little bleeding followed. He had no bad symptoms, made a rapid recovery, and speedily regained good health, never having had any return of symptoms since the operation. The patient was presented at the meeting, in excellent health, and quite free from all urinary symptoms. Regarding this and other cases which had afforded similar results, the author advised that, in certain cases of hæmaturia which was clearly vesical, and was not explicable, except by the hypothesis of impacted calculus or vesical tumour, an incision of the membranous urethra from the perineum, for the purpose of exploring the bladder, should be made. He proposed the incision ordinarily made in the median operation of lithotomy for the purpose of introducing the finger, and forceps if necessary, for research and removal when necessary. The symptoms were described, the possible presence of which generally indicated the necessity, or, at all events, the propriety of adopting such a proceeding. The tumour was examined by Mr. Stanley Boyd, of University College Hospital, and was found to be a simple fibroid.

Mr. JOHN MARSHALL said that it was evident that there must have been many cases of the kind in which an operation would have been useful; and Sir H. Thompson's case offered great encouragement for its performance. The diagnosis of tumours of the bladder, and the mode of operation and after-treatment, were important matters.

Mr. BRYANT approved of the operation adopted by Sir Henry Thompson, the theory of which had been yearly growing in favour. He had not had an opportunity of operating for tumour in the bladder, though the proceeding had suggested itself to him in three cases, in which hæmaturia and other symptoms were present. In one of the cases, the bladder was found, after death, to be full of villous growths. In the other two, there was cancer. Any operation would have been useless in these cases; but the records of surgery contained reports of many cases in which surgical interference would have been justifiable. A clean cut into the bladder, for the purpose of exploration, was not a severe matter, and was quite justifiable in cases which, without it, were evidently hastening towards death. Good results sometimes followed simple incision in inflammatory states of the bladder. As regards the kind of operation, the median was perhaps the best, where the prostate was healthy and the neck of the bladder sound; while, in other conditions, the lateral operation was to be preferred.

Mr. REGINALD HARRISON said that he had little doubt that the case described would give an impetus to operations on the bladder for other purposes than the removal of stone. He could remember the time when, if a surgeon, in performing lithotomy, found anything but a stone, he was looked on with suspicion. He asked whether median cystotomy was really the best mode of proceeding in a case of tumour involving the wall of the bladder. He had opened the bladder from every accessible part; and had always felt, that the median operation gave him least command over the parts, while the lateral incision gave most room. He thought that the danger of hemorrhage in the lateral operation had been rather overrated.

Mr. HENRY MORRIS asked whether an incision in the median line was not equally justifiable, when, though a cure could not be obtained, relief of pain and other symptoms might be afforded, as in chronic cystitis and tubercular cystitis.

He had lately met with an obstinate case of chronic cystitis, in which he had made an incision in the middle line of the perineum, with great relief to the patient, who, however, died at the end of seven weeks from suppuration of the kidneys. He preferred the median incision, because the wound had less tendency than the lateral to heal rapidly.

Mr. HOLMES said that opening the perineum for chronic cystitis was a different matter from the operation described by Sir Henry Thompson. It seemed that the great difficulty was to diagnose between tumours such as those in Mr. Bryant's cases, and chronic cystitis. He did not wish to cavil at the operation of opening the bladder in cases of tumour; he had himself contemplated its performance. When the sufferings of the patient were very great, and the presence of a tumour was indicated, an operation for its removal was justifiable; but where the symptoms were acute, and the growth was making rapid progress, the operation should only be undertaken at the urgent request of the patient's friends. Cystotomy, for the relief of chronic cystitis, was an established operation. He thought that there was no difficulty in keeping the wound open after the lateral incision; and this appeared a better means of reaching all parts of the bladder than the median incision.

Mr. BERKELEY HILL said that cases where a tumour in the bladder could not be dealt with were probably not so numerous as was supposed. The fate of all cases of tumour of the bladder seems so certain, that it would not be right to be deterred from operating by fear of hemorrhage. An opening should be made at once, whenever there appeared any reason to suppose a tumour to be present.

Mr. PEPPER had seen five cases of operation for tumour in the bladder. The first case was that of a female child at University College Hospital, under Mr. Marshall. The child died; and the bladder was found to be filled with a mass of gelatinous polypi. In the second case, there was an enlarged middle lobe of the bladder, which was excised before removing a stone; the man died. The three other cases were at St. Mary's Hospital. Two of the patients died: one from hemorrhage, and one from pyæmia; and the third had an incurable fistula left after the operation. He asked Sir Henry Thompson what would be the best mode of operating on the female bladder. The choice of operation would depend on the character and structure of the tumour.

Mr. GODLEE asked whether actual examination gave an aid to diagnosis.

Mr. J. MARSHALL said that cases of tumour of the female bladder stood entirely apart from those of the male bladder; rapid dilatation of the female urethra enabled the bladder to be readily examined. Encouragement to operate on tumours in the male bladder was afforded by the fact, that the deaths after the operation in males were not more numerous than those in females. In the diagnosis, the age of the patient must be taken into account. The movable tumours (fibroid and polypoid) occurred in children and middle age; cancerous and villous growths later in life. As regarded the operation, some surgeons might prefer one to the other; but the lateral incision seemed to have been generally chosen; it was used in all the successful cases. In most of the unsuccessful cases, the growths had been pedunculated; and, in all the successful cases, the patients had gone on remarkably well, without hemorrhage or other unfavourable symptoms.

Sir HENRY THOMPSON would define the conditions on which operations for the removal of vesical tumours should or should not be performed. There had been great want of clearness in the definition in the successful cases; prostatic outgrowths having been often confounded with tumours of the bladder, from which they were totally distinct. No case of malignant tumour should be operated on; but it was difficult always to identify such tumours. This might be done by rec-

tal exploration, when an irregular hard mass would be felt, especially when pressure was made on the bladder from above. Still the diagnosis was difficult. He would not operate in such cases, nor in villous tumours. He had desired to bring under notice the propriety of making an incision through the perineum in proper cases. Incision was a very simple matter, and often gave much relief; and it was indicated in other conditions besides tumour of the bladder. He believed that there was no difficulty in exploring the whole interior of the bladder by the finger through either the median or the lateral incision, unless in very stout persons. The patient should have an anæsthetic, and an assistant should make pressure above the pubes. In a case of obstinate vesical hemorrhage, he made, two months ago, an incision, and removed a small flake of phosphate from the bladder; since that time there had been no return of the hemorrhage. He had also operated three weeks ago on a medical man, who, for the last year or more, had passed all his urine through a catheter. The patient believed that there was a calculus impacted at the neck of the bladder; but nothing of the kind could be found. An incision was made in the median line, and the mucous membrane of the bladder was found to be healthy. The patient was greatly relieved, and required to pass urine only seven or eight times, instead of fourteen or fifteen, in twenty-four hours. The operation was not cystotomy, but perineal section; and it was mostly all that was wanted. In lithotomy, it was not the incision that was dangerous, but the removal of the stone. He preferred median incision; but the mode of operating to which the surgeon had been accustomed was the best. He did not advocate opening the bladder in all cases of difficulty; he had only desired to point out where this might be done with advantage.—*British Medical Journal*, April 15, 1882.

The Operative Treatment of Phimosis.

Dr. LACLAVOIX believes that every case of congenital phimosis, on account of the numerous inconveniences which it entails, should be operated on. No operation should be performed for accidental phimosis in the acute stage, except in special conditions, but when it has become chronic, an operation is indispensable.

The different operative procedures may be divided into four groups: Incision, excision, circumcision, and dilatation. Simple incision should be nearly always rejected; excision is applicable to only few cases; circumcision should be generally employed. Dilatation should be rejected in cases of cicatricial phimosis, but may be successfully employed in cases of congenital phimosis, although even in these instances it is generally necessary later to excise a portion of the prepuce. Serre-fines are generally made use of to facilitate union, but sutures are equally as good.—*Bull. Gén. de Thér.*, April 30, 1882.

Treatment of Chancroids and Chancrous Buboës with Salicylic Acid.

Dr. AUTIER believes that, without being a specific, salicylic acid can be of great service in these affections. He recommends that the ulcers should be carefully dried twice daily, and then covered with powdered salicylic acid; in the interval, they should be washed every two hours with a five per cent. solution of salicylic acid in glycerine, which should also be injected into the cavities of buboës. If the buboës have narrow openings, he recommends compression; otherwise they are to be covered with charpie soaked in the salicylic acid solution and maintained in position with a spica bandage. When the surface of the ulcers appears healthy, as is usually the case in a few days, the solution may be diluted

with two or three parts of water. The application of the powder should be continued until the wound reaches this healthy condition.—*Bull. Gén. de Thér.*, April 30, 1882.

Destruction of Chancres as a Means of Aborting Syphilis.

Dr. PAUL SPILLMAN draws the following conclusions from an analysis of eight cases in which excision of the primary lesion of syphilis was practised:—

1. Even in cases where the excision seems to have been followed by successful results, it cannot be positively affirmed that the operation produced an abortive effect on the disease, as chancres apparently infective, which were not followed by secondary phenomena, have often been noted.

2. The operation of excision is not a dangerous one when it is accompanied by appropriate antiseptic precautions; cicatrization by first intention, and without any complication, usually rapidly occurs.

3. In certain cases it may be very difficult to excise the chancres without serious mutilation of the organs on which they are situated.

4. The evolution of syphilis, glandular enlargement, secondary symptoms, etc., is in no way influenced by the excision.

5. It has been claimed that the violence of the disease is diminished by excision; that the chancre is the seat of elaboration of the syphilitic virus, and that therefore its excision would serve to diminish the intensity of the affection. But the observation of two of the cases reported proves that excision, even when performed under the most favourable conditions, may be followed by the gravest form of syphilis.—*Ann. de Derm. et de Syphilog.*, Mar. 25, 1882.

Wounds of the Theca Vertebralis, with Discharge of Cerebro-Spinal Fluid.

A paper on this subject by Mr. T. HOLMES was read at the meeting of the Royal Medical and Chirurgical Societies on April 25th. Referring to a case published in the sixtieth volume of the Transactions, in which a copious flow of limpid fluid took place from a wound in the back, and in which it was believed that the ureter was wounded, though it was also admitted as possible that the fluid might have been cerebro-spinal, the author relates two cases: one under his own observation in a patient of Mr. Rouse, at St. George's Hospital, the other from the *Lancet*, in which a similar copious discharge of watery fluid was caused by a wound of the spinal membranes, not involving any wound of the cord or large nerves, as proved in one case by post-mortem examination, and in the other by the position of the puncture. Such wounds do not of themselves produce any symptoms, the loss of fluid being gradual, and the fluid no doubt rapidly re-secreted. Inflammation around them may interfere with the functions of the cord or nerves, even to a fatal degree, and there seems some warrant for believing that the very sudden withdrawal of large quantities of the fluid (as in operation for spina bifida) may produce dangerous syncope.

Mr. HUTCHINSON alluded to the frequent and often copious and long-continued escape of fluid from the ear in head injuries without detriment; but had no facts to add as to wounds of the theca vertebralis. He had not seen immediately serious consequences following rupture or tapping of a spina bifida. Almost constantly, however, arachnitis follows rupture of spina bifida with a small opening; though he had seen one or two cases in which shrivelling of the tumour had ensued on what was described as a rupture of the sac. The liability to arachnitis following escape of the fluid would depend upon the kind of opening present.

Mr. T. SMITH concurred in the statement that the mere escape of fluid from a spina bifida is not followed by immediate ill effects; but if the flow last long,

inflammation is liable to follow. He had seen cases which had continued to leak for days. He had seen cases of death and cases of recovery after spontaneous rupture of a spina bifida; in the latter case the sac shrivels up. He once saw a case where a mistake in diagnosis had led the practitioner to make a long free incision into the sac; and to his (Mr. Smith's) surprise the child rallied from its state of depression, although it eventually died. The fluid is very rapidly re-secreted. As to treatment of the wounds described, there would be more chance of getting closure if treated at once; and the first case related by Mr. Holmes showed the difficulty there was in getting this result at a later period.

Mr. MORGAN had assisted Mr. Holmes in one of the cases referred to. It was that of an infant with a congenital tumour below the mid-dorsal region of a sausage shape, and pedunculated. Pressure had no influence on it; and it was, therefore, removed by an elliptical incision on either side; but when the incision divided the centre of the base of the tumour, the child became collapsed, was with difficulty restored, and died in twelve hours. Mr. Holmes thought the result due to carbolic acid poisoning; and the urine was certainly blackened. The symptoms so resembled another case lately under Mr. Morgan's care that they might both be attributed to the direct effect on the spinal canal. This was a case of a somewhat larger tumour, also pedunculated, and uninfluenced by pressure. It was tapped and cerebro-spinal fluid escaped, followed by immediate collapse, with temporary recovery. Morton's iodo-glycerine was injected into the sac, the pedicle being secured by a ligature, but death took place in a few hours. He was at a loss to explain these events unless from a direct action on the nervous centres. He knew of a case in which the midwife with a pair of scissors slit up the spina bifida without ill result. So that it seems there is more danger when the opening is small than when it freely communicates with the canal.

Dr. WHARRY suggested that the reason why tapping a spina bifida was not followed by immediate effects was possibly due to the rapid re-formation of fluid, and also to the subarachnoid trabeculae not allowing a very great loss to take place.

Mr. JOHN MARSHALL, referring to the subject of wounds of the theca, thought the diagnosis could be rapidly made. Probably in all these cases the presence of some inflammatory action altered the characters of the fluid so that it contained more solid matter than normal. The result may depend on the seat of the wound; if high, being more dangerous than if low down; and also upon the subject wounded. If the wound was quickly closed, there seems no reason why puncture of the theca should be so serious. The fluid has probably something more than a mere mechanical function. In a case of spina bifida in which he was about to inject iodine, the raising the child to a sitting position in order to safely inject the solution after drawing off six or seven ounces of fluid, produced syncope and a convulsive attack. Thus sometimes cerebral disturbance may be set up.—*Lancet*, April 29, 1882.

Treatment of Fractured Thigh.

Dr. HERMANN KÜMMELL, of Hamburg, writes, in the *Berl. Klin. Woch.*, No. 4, 1882, that, for the treatment of fracture of the femur in an infant, the safest and most convenient and successful method is that of vertical extension. This method was first tried by Dr. Schede of Berlin, in 1877, and has since been carried out by this surgeon in all his cases of fractured thigh in children under two years of age, and also in some cases in which horizontal extension had failed with children between three and four. In horizontal extension, in addition to

the eczema and excoriation caused through the constant soiling of the bandages by excretions, and to the great labour attending frequent renewal of the bandages, especially when it is necessary, as in fracture through the upper third of the femur, to include the pelvis, there is the further evil of enforced frequent movement of the injured part, through which movement consolidation is retarded, and dislocation and shortening of the fractured extremity rendered probable results. In this method of treatment, a long continuous band of plaster is fixed to both sides of the injured limb, as high as the seat of fracture, and applied so as to form a free loop below the sole. This long strip is then secured in the ordinary way by circular strips of plaster and by circular turns of a bandage. The leg, having been elevated, is then kept in the vertical position, with the corresponding side of the pelvis suspended, by means of a piece of cord fixed to the loop of plaster, and either attached above to some object over the bed or slung over a pulley, with its free extremity supporting a weight. The fragments of the broken bone then fall into proper position, and remain so, if the extension be maintained until firm union is established. The little patients, it is stated, tolerate this treatment very well, and at once cease to suffer from pain in the injured thigh. Vertical extension does not necessitate constant and complete rest on the back; but Dr. Kümmell does not insist on this as one of the advantages of the method, as he is opposed to the view held by many surgeons, that prolonged rest on the back is dangerous with young patients, and that it causes pulmonary affections and disturbance of the general health. Rotatory displacement of the fragments is not to be feared as a result of vertical extension. In most of the cases observed by Dr. Schede and the author, callus has formed rapidly and in abundance; and in healthy children, it is asserted, consolidation of the fragments is usually well established by the end of the third week, when the bandage and strapping may be removed and the limb lowered. The usual result of this treatment is stated to be speedy and firm union, without displacement, and without any shortening of the injured limb. One disadvantage is mentioned as likely to occur in female infants subjected to this mode of treating fractured thigh. As a consequence of free entrance of air into the gaping ostium vaginae, the little patient may suffer from severe vaginal catarrh, which condition will persist as long as the vertical extension is kept up, but subsequently may be soon removed by careful cleansing and the local application of weak astringents. A tabular statement is appended of twenty-eight cases of fractured thigh in infants treated by this method. Of these patients, twelve were under twelve months of age, and sixteen between the ages of one and two years.—*London Medical Record*, April 15, 1882.

New Method of Treating Simple Transverse Fracture of the Patella.

Mr. LUND, of Manchester, read a paper on this subject at the meeting of the Medical Society of London, held April 17. On the assumption that the chief, if not the only, cause of non-union in such cases is imperfect apposition of the broken fragments, so that actual contact of the osseous surfaces is not attainable, Mr. Lund has adopted this plan: For the first six or eight days the limb is extended on a back splint with foot-piece, and slightly raised; cold evaporating lotion or ice is applied to the knee until nearly all effusion within and external to the joint has subsided. Then while the patient is under the influence of an anæsthetic, a strong steel pin is drilled through each portion of the patella, from the external to the internal border, a small hole being made in the skin by the entrance and exit of the pin, great care being taken by the mode in which the patellar fragments are pierced that the point of the screw-pin does not injure the articular surface of the bone. These screw-pins, which should be placed as

nearly as possible in parallel lines, are next drawn very closely together until the broken surfaces of the bone are brought into perfect contact by means of a double screw instrument which, for the time, holds them firmly in position; while so placed the ends of the pins are inclosed in a coil of very thin copper wire, so arranged in repeated turns as to gain great strength, and then, when the pins are completely fixed, the double-acting screw instrument is removed, the broken surfaces of the bone remaining in absolute contact. Mr. Lund demonstrated the method very clearly by using the knee-joint from an artificial leg in which the broken patella was represented by two pieces of cork kept apart by elastic bands and covered by a knee-cap to imitate the skin. He gave the particulars of two cases so treated with excellent results, and also a third case now under treatment at the Manchester Infirmary. Contrary to what might have been anticipated, these steel pins do not produce any local or constitutional disturbance, although retained *in situ* in the first case for 37 days, and in the second for 43 days, when good osseous (?) union was obtained.

Mr. ADAMS believed that often even ligamentous union failed, and only a periosteal fibrous union took place. A true ligamentous union would not stretch to a greater extent than an inch. He had obtained fairly successful results with Malgaigne's hooks, getting very short ligamentous union; and had never seen any ill results from their use, though such had occurred at King's College Hospital.

Mr. ROYES BELL said the patient alluded to by Mr. Adams was a middle-aged woman in broken health. Erysipelas set in about the punctures of Malgaigne's hooks, and suppuration extended into the joint, causing death. In a case of his where ligamentous union took place, the patella was subsequently fractured in another place, the ligamentous union remaining intact. In a case of double fracture one patella was treated with, and the other without, Malgaigne's hooks. The union obtained by the hooks was better than that without them.

Mr. H. MORRIS ascertained from Mr. Royes Bell, that the fracture treated without Malgaigne's hooks was considerably anterior to the other, and he thought that this might account for the superiority of the latter. He asked what kind of union Mr. Lund believed himself to have attained. He believed a close ligamentous union to be superior to an osseous, and pointed out that the method advocated by Mr. Lister had been practised by other surgeons previously with success, and that Mr. Lister did not claim its invention.

Mr. B. SQUIRE thought Mr. Lund's rods would probably promote the formation of callus.

Mr. BRYANT would prefer Mr. Lund's method to that of opening the joint, if either was necessary. Mr. Lister only recommended his plan in apparently desperate cases, and in such rare cases, he (Mr. Bryant) would prefer Mr. Lund's method. The ordinary methods, in his experience, had produced very good results, and some of the patients were able to follow the occupation of porters, bargees, etc. He pointed out the risk of injury to the articular surface of the bone in Mr. Lund's operation, and had not a favourable opinion of Malgaigne's hooks.

Mr. LOCKWOOD advocated Mr. Manning's plan, as adopted at St. Bartholomew's Hospital.

Mr. GANT treated fractured patella by semicircular pieces of gutta-percha placed round the limb above and below the patella, and kept in apposition by Malgaigne's hooks, aspirating the joint if much effusion was present. The interval between the fragments on leaving the hospital was about a quarter of an inch, and although it often became increased the utility of the limb was not lessened.

Dr. DOWSE suggested division of the rectus to aid the apposition of the fragments.

The PRESIDENT said he had found the results of the ordinary treatment to be satisfactory. In bad cases he had used a method of bringing the fragments together by pins.

Mr. LUND, in reply, said that Malgaigne's hooks were apt to cause tilting of the fragments. In one case he thought he obtained bony union. Very little irritation was caused by the rods, and no callus was induced. He would only use his method in recent fractures, and not in broken constitutions. He had seen very satisfactory results from section of the rectus muscle. Its advantage over Malgaigne's was that the former brought pressure to bear on hard tissues, and the latter on soft tissues liable to suppurative inflammation.—*Lancet*, April 29, 1882.

Aneurism of the Left Axillary Artery; Ligature of the Subclavian; Rupture of the Sac; Amputation at the Shoulder-joint; Recovery.

At the meeting of the Clinical Society of London, held March 10th, Mr. HOWARD MARSH read notes of this case. The patient was a carman, aged 32. He had never had syphilis, nor any serious illness. Eight weeks before admission, he found a small pulsating swelling in the armpit. This rapidly increased, and, when he came to the hospital, measured nineteen inches over its most prominent part. There was great œdema of the whole limb. No pulse could be felt at the wrist. After the patient had been at rest for three days in bed, the subclavian was tied, under the carbolic spray, with a silk ligature, the ends of which were cut short. The case progressed favourably for three or four days, but then the swelling gradually increased in size, and on the seventeenth day hemorrhage occurred from the sac. This having recurred on the eighteenth day, the swelling was laid open, with the object of tying which ever proved to be the bleeding end of the artery. As, however, a gush of arterial blood immediately occurred, and as the patient was still in a very exhausted state, it was thought best to amputate at once at the shoulder-joint. The patient made a favourable recovery. The author remarked that the cause of the aneurism was probably a small rupture of the coats of the axillary artery, resulting from a strain. The case was a good illustration of the usual features of aneurism in the axilla, in respect to its rapid increase, the large size the swelling might attain, and the tendency of the sac to rupture. Ligature of the subclavian—the method of treatment most often successful—seemed to offer the best prospect of cure. It failed through the free establishment of the collateral circulation. Had the patient been in a less exhausted condition, the limb might perhaps have been saved by Syme's operation, even when the sac had given way; but weak as he was, amputation seemed the safer expedient. The silk ligature, after it was thrown off, travelled toward the surface, and could at one time be felt close beneath the skin, and a small shred was discharged through the wound. How it was afterwards disposed of was not known. It never, however, was observed to escape externally. The silk ligature, the author thought, was unsafe, as it was apt to act as a foreign body, and so to provoke a dangerous process of ulceration in the neighbourhood of the artery. He should, on any similar occasion, employ the kangaroo-tendon ligature, which, so far as present experience had shown, was perhaps the most reliable form now in use.

Mr. GOLDING-BIRD suggested that silk should always be soaked in wax, and never in oil. It was curious that in this case a portion of the silk had been removed.

Mr. MARSH thought the ligature had cut through and had been found as of old, but only a shred remained.

Mr. C. HEATH was loath to criticize a case which he had not seen, but it seemed that there had been a doubt as to whether the aneurism had given way. When the vessel was ruptured, then it was surely the recognized practice to open the sac and tie both ends of the vessel. This was what was done in Mr. Syme's well-known case; still, it had been contested by surgeons of eminence. It was best, however, to obtain complete control over the subclavian in the first instance.

Mr. BARWELL thought that in all probability the aneurism had given way. He should have liked to know something about the temperature. The danger of tying vessels in their continuity was now greatly lessened by the use of animal ligatures.

Mr. MORGAN asked what was the condition of the limb itself when removed.

The PRESIDENT considered that the aneurism had in this case given way, but even then he did not think that ligature of the main artery was hopeless. He had himself, in two cases of diffuse popliteal aneurism, cut down in Scarpa's triangle, even through clots, and tied the femoral. This procedure was far more likely to be successful than groping about among clots for the ends of the ruptured vessel. The case recorded afforded another example of carbolized silk making its way through the vessel. It was this that originally made him think of catgut. For his own part, he would not use oil or wax, but only carbolized water, for silk; still, he preferred animal ligatures. He had again turned his attention to this, and he had found catgut prepared with water alone worse than that prepared by sulphurous acid. After use, it showed more superficial infiltration. But he had found the best to be that prepared in chromic acid and sulphurous acid. This might be dried, and was ready for use at any time by simply putting in carbolized water.

Mr. MARSH, in reply, said that when the case occurred this was the best ligature he could get. No doubt ligature of the subclavian had cured axillary aneurism; and then the man, when seen, was sinking. Should he come across another case, he would tie the vessel first again.—*Brit. Med. Journal*, March 25, 1882.

Popliteal Aneurism.

Prof. BARDELEBEN reports, in the *Berliner Klin. Woch.*, No. 1, 1882, a case of popliteal aneurism, and adds some remarks of interest on the treatment of the affection, which seems to be of much less frequent occurrence in Prussia than in this country. The subject of this case was a working tailor, aged 46, who complained, for the first time, of pain and stiffness behind the right knee, in May, 1880. One month later, he noticed pulsation in this region, and four months later observed a distinct tumour. At the end of the year he came, as a hospital patient, under the care of Professor Bardeleben. There was then seen in the right popliteal space an elastic pulsating tumour of the size of a man's fist, which diminished in size and ceased pulsating on compression of the femoral artery. No history of injury could be made out. The patient seemed to have been quite free from syphilitic disease and from rheumatism; the heart was clearly quite normal, and no indications of vascular disease were presented by the radial, temporal, or posterior tibial arteries. The tumour was attributed by the man himself to his habit of always standing when at work.

In the treatment of this case, the affected limb was first fully flexed at the hip and knee, and occasional digital compression was applied to the femoral artery.

This plan was kept up for four days, during most of which period the pulsation in the aneurism was arrested, but had to be discontinued in consequence of much œdema in the foot and leg, and also of sloughing over the heel. The next attempt consisted in applying instrumental compression to the femoral artery. The vessel was readily controlled by pressure of this kind without any complaint from the patient of pain or even uneasiness, but in the course of twenty-four hours gave rise to sloughing of the skin. This result followed the application of a tourniquet first below Poupart's ligament, secondly, above this ligament, and again in the middle third of the thigh. A subsequent attempt to treat the aneurism by the application of an elastic bandage to the limb, and of Esmarch's ligature above the knee, caused much pain, and was followed by sloughing of the skin over the instep, and also by a sudden attack of peculiar mental and nervous disturbance, in which the patient attempted to commit suicide. As it was found that pressure invariably caused sloughing, and as no progress had hitherto been made towards cure of the aneurism, Professor Bardeleben decided on applying a ligature to the femoral artery on Scarpa's triangle. The material employed for this ligature was carbolized catgut, and the operation was performed under strict antiseptic conditions. The wound was dressed antiseptically, and, notwithstanding the proximity of the sloughing sores that had been caused by compression, it healed in the course of eleven days, without the discharge of a single drop of pus. The patient made a speedy recovery, without fever or any other bad symptom; and, although on the third day a large pulsating vessel was observed on the inner side of the knee, and the temperature of the limb during the first two days after the operation did not fall, but rather increased, the aneurismal tumour became hard and small, and soon disappeared, without any return of pulsation. It was noticed, very soon after the application of the ligature, that, whilst the inner side of the thigh had become anæsthetic, the outer side preserved its sensibility. This, Professor Bardeleben thinks, was probably due to the fact that the arterial supply of the outer part of the thigh is derived from the profunda.

In some remarks on this case, Professor Bardeleben states that there was, without doubt, a peculiar tendency in the patient's skin to become gangrenous on the application of even slight pressure. The man did not suffer from diabetes, but the fact of a few small doses of iodide of potassium, administered at an early stage of the treatment, having suddenly caused an eruption over the whole surface of the body, indicated some abnormal condition of the skin. Such condition, as shown by the sudden dilatation of the small cutaneous vessels through the action of an internal irritant, might, it is suggested, have been the origin of the impairment and loss of vitality in the skin, caused by such pressure as would not have had such bad results if applied to the skin of other subjects. In discussing the rival claims of deligation and external compression in the treatment of popliteal aneurism, Professor Bardeleben gives it as his opinion that, though the risks attending the cutting operation may be much reduced by carrying out Lister's antiseptic method, it is better to have recourse to that plan of treatment, which, from its not necessitating any division of skin, is of an antiseptic character. Compression, however, ought not to be carried too far in unfavourable cases; and, when it is clear that the affected limb will not tolerate such treatment, the surgeon should at once resort to antiseptic deligation.—*London Med. Record*, April 15, 1882.

Angioma Communicating with the Jugular Vein.

At the meeting of the Société de Chirurgie, on May 3, M. Farabeuf read for M. Reclus an account of a case of cavernous angioma communicating directly with the jugular vein. On the same occasion M. DESPRÈS also reported a similar

observation made on a child who came to the Cochin Hospital with a soft and irreducible tumour on the neck three fingers' breadth below the lower jaw. It was intended to make an exploratory excision, but believing it to be a cyst, it was opened with a bistoury, when a jet of blood escaped, which was, however, controlled and union by first intention took place. After a few days phlebitis occurred, and proved fatal. The autopsy showed that the tumour communicated by a single venous trunk with the jugular.—*L'Union Méd.*, May 9, 1882.

OPHTHALMOLOGY AND OTOTOLOGY.

Surgical Treatment of Granular Ophthalmia.

BRACHET (*Receuil d'Ophthalmologie*, Feb. 1882) strongly advises the adoption of the surgical treatment employed by Galezowski in many cases of granular ophthalmia, namely, the removal by means of the scissors of the whole of the conjunctiva from the upper and lower culs-de-sac, followed by a few applications of mitigated caustic to the lining membrane of the lids. This treatment is rapid in its effects, and, as compared with other methods, is of very short duration; it insures a complete cure without danger; it saves the cornea from the serious complications which attend the prolonged use of caustics, and it enables the cornea to recover its transparency and polish. It succeeds where other treatment has failed.

Galezowski, by whom the operation was introduced some years ago, is stated to have performed it more than two hundred times, and always with success.

During a sojourn of three years in Algeria, the writer gained a wide experience of granular ophthalmia, and of the little real benefit obtained by treating it with sulphate of copper and similar applications. In proof of the value of the surgical method, he relates the history of two sufferers from this disease who were operated on in 1873 by Galezowski, and adds a description of their present condition. The one patient had suffered since infancy, and had never been treated; the other had suffered for two years, and had been laboriously treated at more than one ophthalmic clinique without permanent relief; neither was able to follow any employment. Excision of the conjunctiva, followed by a few applications of mitigated caustic, effected a permanent cure with restoration of corneal transparency. At the present time, eight years after the operation, vision is excellent; the culs-de-sac are wanting; the conjunctiva passes immediately from lid to globe in vertical cicatricial bands or folds, which in some places join the globe at the distance of one cm. from the corneal margin; the eyelids are intact and well furnished with lashes; the lachrymal apparatus in each case performs its functions normally; the movements of the eyes do not appear to be hindered in any direction.—*Ophthal. Rev.*, May, 1882.

Sclerotomy for Glaucoma.

At the last meeting of the Ophthalmological Society, the President, Mr. BOWMAN, announced that a discussion on sclerotomy would be held on June 8th. This operation, we may remind our readers, has been strongly recommended in recent years as a substitute for iridectomy in glaucoma. In 1867, the operation was foreshadowed by Wecker, who held that if, in iridectomy for glaucoma, an incision could safely be made in the sclerotic without removing any iris, that

would be the best course. In the following year, Stellwag carried this advice into practice in two cases. The theory upon which the operation was recommended and performed was, that the efficacy of any operation for glaucoma depended on the interposition between the lips of the wound of a layer of new and more porous tissue, and that such a layer was only to be obtained when the scar lay in the sclerotic. This, which came to be known as the "filtration scar" theory, was severely criticized by Schweigger; and at the International Congress in London last year, Professor Schoeler reported experiments on animals which appeared to disprove it. The operation itself has varied much in the hands of different surgeons. Stellwag, and later Quaglino (*Annal. d'Ocul.*, 1871) made a peripheral wound with an iridectomy knife; Wecker performed a subconjunctival operation, and, fearing prolapse of the iris, left the central third of the sclerotic undivided. In England, the first writers on the subject were Messrs. Bader (*Ophthal. Hosp. Rep.*, vol. viii.) and Spencer Watson; the latter, in a paper read before the Clinical Society in 1876, advocated its employment in acute glaucoma; but, as a rule, operators seem to have confined the operation to chronic glaucoma in its various forms. A very full summary and bibliography of the subject have been published by Mauthner in Knapp's *Archives* (vol. vii.). It is proposed in the discussion to deal, firstly, with the various manners of performing the operation; secondly, with the forms, stages, and complications of glaucoma to which the several methods of performing the operation are applicable; and, thirdly, with the *rationale* of the treatment. Should such an explanation be forthcoming, it would no doubt throw much light on the former heads of the discussion.—*Brit. Med. Journ.*, May 20, 1882.

Affections of the Eye from Disturbed Circulation in the Carotid.

Dr. JUL. MICHEL (*Wiesbaden*, 1881) has found that if a carotid artery be compressed in man, a paling of the papilla of the corresponding side, a fainter column of blood in the arterial vessels, and a diminution in width of the venous retinal vessels may be observed for a short time. This stage passes quickly, and great venous stasis and absence of venous pulsation show themselves. A similar venous stasis of the retina is visible when one arm is stretched upward. Ligation of one carotid is followed, immediately after the operation, by complete arterial and venous anæmia; later, by filling of the collateral channels; but a venous hyperæmia persists on account of the diminution of arterial pressure. This alteration is observed in the eye corresponding to the ligated carotid. In the venous system of the side opposite to the ligated vessel, a stronger rhythmical pulsation can be seen. Atheroma of the carotid is in intimate relation with opacities of the lens; the so-called senile cataract, as well as unilateral cataract with unknown cause, finds in this a satisfactory explanation.—*Arch. of Ophth.*, March, 1882.

A New Mydriatic.

Dr. EMMERT, of Berne (*Correspondenz-blatt*, Jan. 15) has made a series of experiments on the pupil-dilating powers of hydriodate of hyoscin, a crystalline salt obtained by treating hyoscin with hydriodic acid. Hyoscin is an alkaloid obtained from amorphous hyoscyamin. The results showed that the new salt acted more energetically and more rapidly than either sulphate of atropia or duboisin. The solution need not be stronger than 1 : 1000, and even then is more active than the half-per-cent. atropia-solution. It is also less poisonous than the latter. Even at its present price, which will naturally be reduced if the drug becomes better known, it is a cheaper, as well as a stronger, mydriatic than atropia.—*Practitioner*, 1882.

MIDWIFERY AND GYNÆCOLOGY.

Landmarks in the Operation of Laparo-Elytrotomy.

Dr. WILLIAM M. POLK, Professor of Obstetrics in the University Medical College, New York, recently demonstrated certain anatomical points bearing upon the operation of laparo-elytrotomy, before the New York Obstetrical Society. The remarks made by Dr. Polk on that occasion appear in an amplified form in the May number of the *New York Medical Journal and Obstetrical Review*. The specimen shown, taken from the body of a woman who had been murdered in the seventh month of pregnancy, was a dissection showing the relations of the pelvic contents during the latter part of gestation, and especially the course of the ureter. Practising the operation upon this and other cadavers, the author has found that the ureters do not follow the pelvic wall to a point near the ischial spine, as in the non-pregnant condition, but that, crossing the pelvic brim at the common iliac bifurcation, the left just behind, the right just in front of, that point, they descend into the canal to the brim of the bony pelvis, the point being about the synchondrosis. In this course they accompany the internal iliac artery, the right in front of the vessel, the left crossing it obliquely. Reaching the bony brim (the ilio-pectineal line), they leave the pelvic wall, emerging from beneath the base of the broad ligaments (in pregnancy about on a level with the pelvic brim, and carried back on a line with the synchondrosis), and take a course downward, forward, and somewhat inward, passing about midway between the pelvic wall and the cervico-vaginal junction, but approaching very closely the antero-lateral wall of the vagina, as they turn more decidedly inward, on a lower plane, to strike the base of the bladder three-quarters of an inch below the cervix, terminating in the bladder at a point (the subject being on the back) just two inches below the spine of the pubes. A line drawn from the bifurcation of the common iliac to the spine of the pubes corresponds in the main to the line of the ureters. Along this line they have the following relations to the pelvic brim (in the recent state): At the bifurcation, half an inch below, at the extremities of the transverse diameter of the pelvis, about an inch; and at the spine of the pubes two inches below. As a whole, the tubes in the pelvis are situated upon a higher plane than in the non-pregnant condition, having been carried slightly upward while being separated from their close relations with the pelvic wall by the ascending uterus. How far they may be elevated in a case of extreme pelvic deformity with a pendulous abdomen, and the uterus correspondingly displaced, the author is unable to say, but thinks it probable, that the bladder being empty and not dragged upwards, thus preserving the normal position of the vesical end of the tubes, the displacement would not be such as to bring any part of them much above the points indicated.

Another matter which Dr. Polk took occasion to investigate was the ground of the objection to operating upon the left side. In view of the strong probability that the operation can be done on the same side but once, this, he remarks, is a very important question. He did the operation upon the left side, the vessels being injected with plaster and the rectum distended. He found that the rectum offered no such obstacle as is commonly supposed, and that the operation was as feasible upon one side as upon the other. After the operation the organ was carefully examined, and found in no way disturbed. In looking at its position this was readily accounted for; it lies behind the broad ligament. In entering and leaving the pelvic canal we cross the brim between the base of the broad ligament and the posterior surface of the bladder. This latter is about on a line

with the ilio-pectineal eminence, while the former is as far back as the synchondrosis; here is ample space for manipulation and extraction.

The important structures that Dr. Polk regards as most likely to suffer are the vessels going to the uterus through the broad ligaments. These, by being stretched and dragged upon in extraction, might be torn if the sides of the incision were not carefully supported in cases requiring powerful traction.

Unsuccessful Porro Operation.

Dr. GERICHARD publishes an account of an unsuccessful Porro operation on a woman, aged 25 years, with dorsal cyphosis of the eighth vertebra, of inflammatory origin, dating from the age of six. The inferior strait of the pelvis was reduced in diameter to 4 centimetres. The uterus at term caused the abdominal walls to hang down like a wallet five fingers' breadth below the knees. Porro's operation was performed, and a healthy male child was extracted. The mother died on the third day without any peritoneal complication, but accompanied by meteorism, dyspnœa, and heart failure.—*Ann. de Gynecol.*, May, 1882.

Extra-Uterine Fœtation treated by Antiseptic Abdominal Section; Recovery.

A paper on this subject was read by Mr. KNOWSLEY THORNTON, at the meeting of the Obstetrical Society of London, held April 5th.

The early history of the case was narrated at the March meeting of the Society. The author would divide cases of extra-uterine fœtation into three classes: 1. Those in which accurate diagnosis is possible. 2. Those in which probability, but not certainty, in diagnosis can be reached. 3. Those in which the nature of the case is not suspected until internal hemorrhage or other untoward accident takes place. In Cases 1 and 3 he thought it bad practice not to operate; in Case 2 an exploratory operation should be performed if the symptoms were urgent. But such operation should only be performed (1) under strict Listerian precautions, and (2) by a surgeon of special experience in abdominal section, for they were extremely difficult.

Dr. ROUTH said that wherever there was a growing abdominal tumour, and a complete decidua was voided per vaginam, the diagnosis of extra-uterine fœtation might be made. The successful removal of the placenta in this case was due to its hypertrophied condition. Possibly the placental souffle might have been heard.

Dr. ROGERS said that the souffle heard over fibroids was not so marked as that of the placenta. He thought the presence of milk in the breasts would aid diagnosis.

The PRESIDENT drew attention to the persistent life of the placenta after fœtal death, and its great hypertrophy. He did not believe the souffle was placental; he called it uterine. The discharge of an entire decidua was a valuable diagnostic aid. He remembered a case in which such a decidua was passed; rupture of the sac and internal hemorrhage took place. After a few days he evacuated the hæmatocele per vaginam and found chorionic villi in the fluid. The patient did well. Nowadays he would have had laparotomy done to get the bleeding stopped.

Mr. THORNTON said the souffle was not heard; had it been it would have to him strengthened the diagnosis of fibroid. The case narrated by the President was a very rare one. He thought that now abdominal section would be attended with less risk than the course followed.—*Lancet*, April 22, 1882.

Storage and the Utilization of the Phosphates in Pregnancy.

In a recent number of the *Union Médicale*, Dr. DELATTRE discusses a phenomenon of early pregnancy which he considers has not hitherto received the attention which, both on physiological and therapeutical grounds, it deserves. He refers to the almost complete disappearance of the phosphates from the urine. These salts, he says, are, except the small proportion as yet required by the development of the fetus, either stored up in the maternal bones, which increase in weight and density, or, occasionally, deposited on their surface in the form of osteophytes, which have long been looked on as errors of nutrition. In the later months, when the foetal bones are growing and ossifying rapidly, these reserves are drawn on, and the osteophytes, if present, disappear. The absorption is not complete at the time when the child is born, but goes on during the normal duration of lactation supplying phosphates to the milk. Such is the course of events in the case of a healthy and well-nourished woman: if, on the other hand, she be weakly and ill-fed, she is compelled, instead of laying up and subsequently employing a reserve of phosphates, to draw on her own tissues for the supply, which, after all, is insufficient for the wants of her child, who is consequently puny, rickety, and late in dentition. These considerations suggested to him the administration of phosphates in the most easily assimilated form to the mother during the whole period of pregnancy; and this treatment was in nine cases out of ten followed by the best results. In one instance, out of four children, the first two were feeble in mind and body, with enlarged glands, soft bones, pale complexion, etc.; but the last two, though born after the mother had been further reduced by anxiety and a nervous malady, were robust, rosy, and boisterous. This he attributes solely to the employment during the last two pregnancies of the treatment mentioned. Again, the first two children of one of his colleagues did not cut their first teeth until more than eleven months of age, but the third, after the mother had been taking phosphate of lime, cut them without any disturbance of health at a few days over four months, and was in every respect stronger and healthier than the older ones. He also believes that he has seen a marked amelioration in the vomiting and other nervous derangements accompanying pregnancy in the cases in which he has adopted this mode of treatment.—*Med. Times and Gaz.*, April 15, 1882.

Hydrorrhœa during Pregnancy.

M. QUEIREL has published in the *Marseille Méd.* an interesting memoir, in which he studies the various elements of the still debated question of the nature of the watery discharges frequently occurring during pregnancy, and spoken of under the generic name of hydrorrhœa. He relates first two cases. In one, a multipara, six months advanced in pregnancy, there had been two effusions of colourless fluid. He was called after the third, which occurred during the night without conscious pain. From the odour, the marks on the linen, and the abundance of the loss, he had no doubt that this was a flow of amniotic fluid, although there was no commencing miscarriage. With prolonged repose and laudanum injections, the patient went on satisfactorily to full time, and was delivered of a healthy child. In the second case, a similar loss occurred at the fourth month, accompanied by abdominal pain and uterine colic. Rest and laudanum injections relieved the pain and arrested the loss. Similar phenomena reappeared and disappeared at the end of five weeks, but fifteen days afterwards the discharge recurred and was followed by abortion. The fetus was six months old and well developed. M. Queirel points out that cases are reported under the

name of hydrorrhœa which are of certainly different natures, and include the flow of fluids of a very different aspect, nature, and origin from amniotic fluid. In some cases, there is a rupture of the membranes from injury or severe contraction, chiefly occurring during the night. This form of rupture is usually followed by labour from six to nine weeks afterwards. The discharge in these cases should be called hydramniorrhœa. When the liquid which escapes presents somewhat of the character of the amniotic fluid and the flow is reproduced at regular intervals, and the pregnancy continues its regular course, the case is probably one of true hydrorrhœa; that is to say, a flow of serous fluid secreted by the maternal vessels and the external surface of the ovum. This is the theory of Naegelé. Exceptionally, the possibility may be admitted of a fluid furnished by an accidental cyst, by a twin ovum of which the product has been dissolved, or by the uterine glands of the cervix, true catarrh of the cervix. Finally, cases may be diagnosed which may be confounded with these, and are not the least important; that is to say, cases of incontinence of urine, or of vesico-vaginal fistula, and cases in which the fluid may come from the vulvar glands. The mistake of confounding the flow with escape of urine has, especially, often been committed. The following case observed by Magail deserves to be related as an example. A woman, in her first pregnancy, several times had watery discharges; she was, however, delivered at full term of a living child, and the hydrorrhœa continued after pregnancy. In the second pregnancy the flow did not cease, and it was verified by several physicians whom she consulted. M. Depaul himself treated her for chronic affection of the uterus, and discovered only after several weeks of treatment that the fluid was furnished by the bladder. There was not, however, any vesico-vaginal fistula, but the anterior wall of the vagina was relaxed and ruptured on the middle of the vulva. There was a vaginal cystocele, with depression of the uterus. M. Magail relieved the infirmity by raising the uterus with the aid of tampons immersed in astringent fluid.—*London Medical Record*, March 15, 1882.

Syphilis in Pregnancy and its Effects on the Offspring.

In this paper, Prof. VON HECKER, of Munich, gives an account of 173 cases of childbirth in connection with syphilis (*Wiener Medizin. Blätter*, 1881, No. 37). The cases are divided into four groups. The first includes cases, 81 in number, in which the mother at the time of her confinement was suffering from active syphilis which had not been treated. Broad condylomata about the anus and on the labia, or ulcers of the fossa navicularis, were usually present, but general signs of syphilis were very rarely found. Of these children, 46 were born at term; 35 were premature or stillborn; 46 children were free from signs of syphilis at birth, and remained so during their stay in the lying-in hospital. On the other hand, 25 children were born in a macerated condition, without any syphilitic lesions of the internal organs. The placenta, however, was frequently increased in weight. In seven cases the children showed specific lesions, such as pemphigus, or syphiloma of the internal organs; while in three, death was ascribed to non-syphilitic causes.—Group 2 comprises cases in which the mother's syphilis had been treated, usually in hospital, for a shorter or longer period. In the 32 cases of this kind, a similar effect was produced on the offspring as in group 1; 14 children were born at term, and 18 prematurely; 11 were quite healthy; 9 dead and rotten; 4 bore signs of syphilis; and 8 were weakly, but not specially diseased.—Group 3 contains 7 cases of old syphilis; 2 of the children were born healthy; 4 with signs of syphilis; and 1 was in a weakly condition.—Group 4 consists of 53 cases in which, in spite of the most careful examination, no trace of syphilis was discovered in the mother. Consequently, in the opinion of the author, the children derived

syphilis from the fathers. The 53 births produced 55 children (two being cases of twins). The fetuses only reached maturity in very rare instances, and the majority were much below the normal weight. Thus, 23 weighed between 4 and 5 pounds, and 48 between 3 and 6 pounds. Only 2 were born in a state of maceration. But 18 were born dead; 12 died within twelve hours after birth; and 16 during the eleven following days, leaving only 9 who survived. Pemphigus was noticed 41 times, and in most cases was present at birth. Affections of the lungs were observed in 31 cases, under the form of white lobular pneumonia in 18, and of syphiloma in 14. Abscess of the thymus was noted 16 times; and syphilitic disease of the liver 14 times, always in the form described by von Barenprung. In 12 cases there was induration of the pancreas, which was considerably enlarged, and of cartilaginous hardness. Section of the organ was difficult, and was attended by a grating sound, similar to that produced in cutting through scirrhus. The spleen was enlarged in 10 cases; the suprarenal bodies were indurated in 8; the brain was affected in 3; and peritonitis was found in 3 cases. These facts support the author's opinion that, in most cases of inherited syphilis of the internal organs, the father is the source of the disease.—*Lond. Med. Record*, Jan. 15, 1882.

On the Menstrual Wave.

From an interesting paper on this point, Dr. WM. STEPHENSON concludes:—

1. That the menstrual life is associated with a well-marked wave of vital energy which manifests itself in the temperature of the body, in the daily amount of excretion of urea, and to a slighter extent in the pulse rate.

2. That the cycle of changes takes a true wave form, divisible as to time into two nearly equal parts, the one below, the other above, the average for the whole period.

3. That the length of this wave varies in different individuals, and may vary also in the same person. The urea wave and the temperature wave are equal in length in the same case.

4. That menstruation does not correspond with the apex (or "climax") of the waves, but occurs five or six days after the decline has begun. It is probable that normally it occurs when the temperature curve reaches the mean; this was the case in nine out of ten menstruations. The flow or evacuation cannot be regarded as the cause of the decline.

5. That the temperature wave is the most uniform and gradual in its rise and fall. In the urea curve, the transition to elevation takes place more quickly, even suddenly; in one case it rose in twenty-four hours from -15 to $+15$ per cent.

6. That the temperature wave and urea wave are independent of each other; for whilst in one case they are exactly synchronous, in the other, the urea wave is four days in advance of the temperature wave.

7. That whilst the pulse wave is not so marked in character, it also shows a decided influence; it is depressed after menstruation, and manifests a distinct rise some days before the next period.

8. In all the waves there are evidences of secondary waves. This is seen in the temperature just after the rise above the mean, and the explanation of the irregularity in certain cases may be that this secondary wave is separated from the primary, and stands out more distinctly. The sudden elevation which characterizes the urea wave may be due to the influence of two waves. From a different analysis of the pulse curve, he is inclined to believe that it has an independent wave of from five to six days' duration, and on this wave is superimposed the menstrual wave which causes the depression and elevation already noticed.—*Amer. Journ. of Obstet.*, April, 1882.

Retention of Menstrual Fluid in One-half of a Double Uterus.

At the meeting of the Obstetrical Society, held February 1, Dr. GALABIN related the case of a patient, aged fifteen, who was brought by her mother for consultation for symptoms exactly resembling those of ordinary severe spasmodic dysmenorrhœa. No swelling or tumour had been noticed. Menstruation was fairly regular, and rather profuse. The pain was felt chiefly during the flow, was intermittent, agonizing in severity, and led to retching and hysterical manifestations. On examination, a firm globular swelling, without any fluctuation or elasticity, about as large as the uterus at three months and a half pregnancy, was felt through the anterior vaginal wall. The os was difficult to discover, and was displaced backwards and flattened antero-posteriorly. The patient was so hyperæsthetic that it was impossible to attempt to use the sound. The author rejected the hypothesis of fibroid tumour on account of the patient's youth, and the commencement of the symptoms with puberty, and felt sure that menstrual fluid would not accumulate to any amount in the uterus if there were any exit whatever through the cervix. He therefore diagnosed retention in one-half of a double uterus. It was agreed with Dr. Stirling, of Grangeroad, under whose care the patient had been, that an anæsthetic should be given, and the swelling evacuated if the diagnosis appeared to be confirmed on use of the sound. Under anæsthetics it was found that the sound passed easily to the normal length, going rather towards the right side, and the os appeared to be displaced a little to the right. The swelling was then punctured, and the usual treacly fluid, seen in cases of retained menses, began to escape. The opening was enlarged with scalpel and director, till it easily admitted the finger, and about ten ounces of fluid escaped. No injection was used on the spot, but it was intended to commence antiseptic injections, after allowing a few hours for complete escape of the fluid. The extreme hyperæsthesia and hysterical resistance of the patient, however, made it impossible to do more than syringe the vagina. Discharge of sanguineous fluid was free up to the third day, but it then almost stopped, and what there was became offensive. Next day febrile symptoms set in, the temperature rising to 104.6°, pulse to 140. The patient's friends refused to allow an anæsthetic to be given to wash out the uterus until the seventh day, when the author saw her again. There was then still high fever, but no sign of peritonitis. An anæsthetic having been given, the opening into the left half of the uterus was again enlarged, and the cavity washed out with solution of absolute phenol, 1 in 40. Considerable improvement followed up to the twelfth day, although it still proved to be impossible to do more than syringe the vagina, and little doubt was felt about the patient's recovery. On the twelfth day she was suddenly attacked with violent pain in the abdomen and collapse, and died in about twelve hours. The author thought that the symptoms pointed to rupture either of the Fallopian tube or of some abscess in the neighbourhood.

Dr. GRAILY HEWITT's experience had led him to the conclusion that it was safer, in performing the operation for retained menses, to make a small opening and allow gradual escape of fluid, and gradual contraction of the walls of the cavity, which were often weak and thin. If allowed to discharge itself too quickly a suction might afterwards be exercised, and septic material drawn in.

Dr. GERVIS thought that Dr. Galabin had himself pointed out what would have been the most useful addition to the conduct of the case, the washing out with antiseptic fluid the uterine cavity. He agreed with Dr. Hewitt as to the importance of moderately slow evacuation, but with antiseptic precautions, thinking that the danger was less through any uterine suction than through decomposition of unremoved fluid.

Dr. WYNN WILLIAMS differed from Dr. Graily Hewitt in that he had made a very free opening, to get rid of all the menstrual fluid at once. He would have syringed out the uterus with a solution of iodine, which he believed the safest and best antiseptic. He would also have avoided making a second incision, any septic condition being present.

Dr. CHAMPNEYS had seen a case of retained menses in one-half of a double uterus, under Dr. Winckel, of Dresden. In this slow evacuation did not prevent a fatal result, which was caused by the retraction of the uterus from an adhesion, which tore a hole in the thin uterine wall. Death resulted from septic peritonitis.

Dr. CLEVELAND was surprised at the fear expressed as to the use of carbolic acid injections. In chronic inflammation of the bladder he had used injections of absolute phenol, 1 in 50 or 60 of water, with excellent results.

Dr. CARTER agreed with what had been said as to the dangerous results which had at times followed the injection of a solution of carbolic acid into the uterus. He related the case of a patient who was for some time in a very critical state after washing out the uterus the third day after a miscarriage with a solution of the strength of 1 in 80.

Dr. MALINS thought there was some doubt about Dr. Galabin's diagnosis in the absence of an autopsy. The symptoms and physical state did not seem inconsistent either with an anterior hæmatocele or thrombus in the cellular tissue. He had met with similar cases in which the difficulty in insuring drainage and disinfection had been overcome by using a winged catheter with the end cut off. He thought nothing better than tincture of iodine for disinfection.

Dr. ROUTH could not agree with Dr. Hewitt in his advice to make a small opening. Experience proved that it often closed, and occasionally was followed by fatal symptoms. His own plan was to draw off by a large aspirator, and to inject iodine solution, doing this morning and evening, and keeping in a drainage-tube.

Dr. MATTHEWS DUNCAN remarked that he, in cases of retained menses, made a free opening and allowed the fluid to drain away, using no injection of any kind. He had in a considerable experience had no fatal case or evil result, and he believed he had observed injurious consequences of the injection of plain warm water in cases which he had witnessed.

Dr. GALABIN thought that the plan of gradual evacuation was desirable when the quantity of retained fluid was large, but not when it was small or moderate. He did not think the fatal result in his case could be attributed to the injection of carbolic acid, or even to the second incision; for a marked improvement had followed that proceeding, and continued for at least four days. He did not believe the case could have been one of hæmatocele, for the swelling had been perfectly movable, and he did not think that the contents of a hæmatocele ever so perfectly resembled the uniform treacly fluid seen in cases of retained menses.
—*Lancet*, March 11, 1882.

Unilateral Vaginal Oöphorectomy.

Dr. BRAITHWAITE, of Leeds, read a paper on the above subject at the meeting of the Obstetrical Society of London, on April 5th.

Case 1. The patient, aged 30, was the wife of a workman. She suffered from attacks of dyspnœa, which were brought on by exertion, and which could only be relieved by certain very peculiar positions of the body. There was a mitral murmur: the patient was pale, and in wretched general health, and the muscle of the heart probably extremely feeble. Menstruation was normal. There was a prolapsed ovary, pressure on which did not bring on the dyspnœa, but caused much

pain. The diagnosis was that the dyspnœa was cardiac, but in some way excited by a prolapsed and very tender ovary. In no other way could the relief by posture be explained. The prolapsed ovary was removed, with the result that the dyspnœa was nearly but not completely cured.

Case 2. The wife of a miner, aged twenty-two, a healthy-looking woman. She had always been very hysterical. She suffered from constant pain in the left ovarian region, dating from the birth of her first child three years and a half previously; since which time she had never been free from it, except during the last three months of her succeeding pregnancies, three in number. The left ovary was prolapsed behind the uterus, and exquisitely tender. It was removed, with the result of complete cure. The author believed that the vaginal method of oöphorectomy was the best and simplest for ovaries which were prolapsed or non-adherent.

Dr. ROBERT BARNES regretted that the attitude assumed by London surgeons towards those who practised obstetrics seriously obstructed the progress of this branch of surgery. All great improvements in surgery were largely due to a spirit of enterprise, it might be said of experimental research. He thought that Battey's operation had now emerged from the doubtful domain of experimental surgery, and that we should soon arrive at definite conclusions as to the scope of its application. In a case in which, six months ago, he had removed the ovaries, the fibroid which formed the immediate cause of suffering had almost shrunk away. There was a proclivity, from anatomical reasons, to prolapsus and disease of the left ovary rather than the right. He inquired if the Fallopian tube had been removed. This question was of physiological as well as surgical interest.

Dr. HICKINBOTHAM thought that in Dr. Braithwaite's first case there was a large amount of hysteria. He attributed some of the relief obtained to the rest and other therapeutic means incident to hospital treatment. He asked what amount of small cysts indicated disease, and what symptoms did they produce? They were seen in ovaries removed for widely different conditions.

Dr. HEYWOOD SMITH said that the interest of the cases would be enhanced if the condition of the patients was reported in six or twelve months; for Battey found that when one ovary only was removed the pain was apt to recur. He thought the abdominal operation preferable in single women; but the incision should be three or four inches in length. The ovaries he had removed he had found diseased. He had no doubt that the operation in proper cases was destined to be of the greatest service.

Mr. KNOWSLEY THORNTON thought it still an open question whether oöphorectomy was justifiable for ovarian pain; but there was a great field for it for hemorrhage from fibroids. Accumulated statistics showed that abdominal oöphorectomy was a very safe operation, but that vaginal oöphorectomy was not. He did not think London was behindhand in abdominal surgery.

Dr. GERVIS did not think that the decision as to the advisability of this operation should be influenced by the possibility of a subsequent recurrence of hysteria. In the cases in which he had performed it for local suffering the result had proved its utility.

Dr. MATTHEWS DUNCAN was not opposed to oöphorectomy; but he could not adopt the theory implied in the first case read. To remove one ovary as a treatment of cardiac dyspnœa he regarded as a wild proceeding; nor could he imagine that it would ever come within the range of rational medicine.

Dr. BRAITHWAITE had removed part of the Fallopian tube in the second case, not in the first. He had secured the pedicles with strong catgut, and united the vaginal wound with one suture only at its lower third. He did not think there

was any element of hysteria in these cases. The relief to the dyspnœa in Case 1 by the peculiar positions described showed that it was not altogether cardiac. Since the paper had been sent in he had heard that the patient was now suffering from cardiac dropsy. Had the operation been done earlier the result might have been better.—*Lancet*, April 22, 1882.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

The Mechanism of Death from Chloroform.

A discussion is now proceeding at the Paris Académie de Médecine on the dangers of chloroform, and the most noteworthy contribution which it has elicited is a statement by M. VULPIAN of certain teachings of experiment on the subject. The lessons are by no means reassuring to those who look on chloroform with grave suspicion. The danger of death is shown by experiment to be present at the commencement, during the course, or at the end of the chloroformization, and even sometimes for some hours or days subsequently. The occasional cases of death immediately after the commencement of inhalation receive their explanation from experiment. In healthy animals respiration may be at once arrested by pinching the superior laryngeal nerves, and even by a strong sensory impression. Thus, if chloroform is merely applied to the nostrils of an animal, respiration is sometimes arrested. The medulla oblongata has been thought unaffected by the inhalation of chloroform; but, although resisting the influence of chloroform longer than other parts of the nervous system, it is unquestionably affected, in some degree, even in moderate anæsthesia. If the pneumogastric nerves are divided in a healthy animal, it continues to breathe. Stimulation of the central ends then arrests respiration, which recommences, even though the peripheral extremities are faradized. But if the same experiment is performed on an animal under the influence of chloral or of chloroform, the breathing does not recommence after it has been arrested by stimulation of the divided pneumogastries. This shows that in the anæsthetic state the medulla oblongata is in a functional condition different from its normal state. Again, in an animal under normal conditions, faradization of the peripheral ends of the divided pneumogastries arrests the heart in diastole; but if the stimulation is continued, the contractions recommence. If the same experiment is performed on an animal under the influence of chloroform, the arrest of the heart is more readily produced, and is final. Hence chloroform acts on the respiratory centres; but it acts also upon the motor ganglia of the heart. In animals the cardiac failure is much more grave than the respiratory failure; life cannot be saved in more than one in forty of the former, although in the more frequent cases of respiratory failure life can often be preserved by artificial respiration. M. Vulpian fully confirms the slighter degree of danger involved in the use of ether, in consequence of which he invariably prefers it as a means of obtaining anæsthesia in experiments on animals.—*Lancet*, April 8, 1882.

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The following works have been received:—

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 Zur Ätiologie der Akuten Exantheme. Von Dr. VINCENT PODHAJSKY.
 Ueber Parametritis und Perimetritis. Von Dr. R. GRENLICH, in Berlin. Wien, 1882.
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Contributions from the Chemical Laboratory of the University of Michigan. Vol. I. Pt. I.

- Admission of Women to the Massachusetts Medical Society. By JAS. R. CHADWICK, M.D. Boston, 1882.
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- Ninth Registration Report of Michigan for 1875. Lansing, Michigan, 1881.
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- Annual Report of the President of the Inebriates Home for 1881. Fort Hamilton, 1882.
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- Eleventh Annual Report of the Foochow Medical Missionary Hospital. June, 1882.
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The following Journals have been received in exchange :—

- Bibliothek für Læger, xii. 2, 3, 1882.
- Nordiskt Medicinskt Arkiv, xiv. 1.
- Upsala Läkareförenings Förhandlingar, 2, 3 to 8, 1882.
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- Annali Universali di Medicina e Chirurgia, Feb. to July, 1882.
- Gazzetta degli Ospitali, Nos. 23 to 73, 1882.
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- L'Imparziale, Nos. 4 to 16, 1882.
- Lo Sperimentale, Nos. 2 to 7, 1882.
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The usual American exchanges have been received ; their separate acknowledgment is omitted for want of space.

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THE
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ARTICLE I.

THE DIGESTIVE POWER OF COMMERCIAL PEPSIN IN ARTIFICIAL DIGESTERS AND IN THE STOMACH. By C. L. DANA, A.M., M.D., Professor of Physiology in the Woman's Medical College of New York; Physician to the Class of Nervous Diseases, Northeastern Dispensary; Member of American Neurological Association; of American Academy of Medicine, etc.

PEPSIN in most respects resembles a true chemical ferment, *i. e.*, it acts in minute quantity without great loss to itself. It will only digest in acidulated solutions, the amount of acidity varying between .1 per cent. and 1 per cent. of free HCl (see later on). Pepsin acts almost exclusively upon albuminous matters. Its action in a given solution ceases after a certain time. Addition of acid or withdrawal of digested products prolongs the action, but it will eventually stop not to be renewed, the ferment being either decomposed or used up.

Pepsin exists in the gastric juice in extremely minute proportion. The exact per cent. is not known. The pure ferment has never been obtained in sufficient amount for accurate analysis. It seems to have something of the composition but none of the reactions of a proteid. Prepared pepsins are mixed normally with peptone and other albuminous matters; commercial pepsins are generally mixed with starch, sugar, etc.

Investigations into the value of pepsins artificially obtained have been made by Sieveking,¹ in 1857, by Pavy,² in 1863, Guibourt,³ in 1865, Tuson,⁴ in 1870. Since then by a great many persons, *e. g.*, A. Petit,⁴

¹ Med. Times and Gazette, 1857.

² Journal de Pharm. et de Chem., 1865.

³ Lancet, Aug. 1870.

⁴ Same, Jan. 1830.

Dowdeswell,¹ Golowatschon,² Ewald,³ Lees,⁴ Sée,⁵ and Langley.⁶ In this country Mr. E. Sheffer first studied it systematically.⁷ He was followed by J. S. Hawley,⁸ Kretzschmar,⁹ Wreen, Squibb,⁹ Lankford and others.

It would seem that the working power of pepsin ought to be very exactly known. This is not the case, however, practically, and it must be remembered that many of the above experimenters only attempted to cover special grounds. The standard adopted by the British Pharmacopœia is: one grain of pepsin should dissolve one hundred grains of coagulated egg-albumen in six hours at a temperature of 100° F.

According to a report made to the American Pharmaceutical Association,¹⁰ from five to ten parts of pepsin should dissolve at least one hundred and twenty parts of egg-albumen at a temperature of 104° in five or six hours. Petit, Dowdeswell, and most of the German experimenters found that the majority of pepsins came up nearly to the British standard.¹¹

My own and other experiments show, however, (1) that different brands have different strength; (2) that the same brand may vary in strength at different times; (3) and that there are a number of details connected with the process of artificial digestion by which the power of the pepsin can be greatly modified. Thus a pepsin can be made to do four times its usual work by keeping the temperature at 50° C. (Petit); much more work can be done by increasing the amount of pepsin, by finely mincing and constantly stirring the albumen, by digesting in a large broad vessel, accessible to air, by occasionally adding acid, and by removing digested products. We have no official standard test covering all these points, although such a thing is much needed.

As a rule, the declarations upon labels regarding the power of the pepsin are utterly unreliable. The results claimed will not be obtained unless special precautions be taken and not always then.

I made a series of experiments with the following objects:—

1st. To test the comparative value of various pepsins.

2d. To test their absolute value (outside the stomach) under conditions not so artificial as those sometimes employed. I wished to find, not how

¹ Practitioner, 1880.

² Zur Lehre über den Process des Magens. Inaug. Dissert., Moskau, 1880.

³ Lectures on Digestion, Berlin, 1878-9.

⁴ Brit. Medical Journal, March and April, 1880.

⁵ Journal de Thé., viii. 4, p. 125, 1880. See also F. Kessler, Inaug. Dissert., Dorpat, 1880, and Schmidt's Jahrbuch., clxix. p. 234.

⁶ Journal of Physiology, Jan. 1882.

⁷ Am. Journ. of Pharmacy, Feb. 1882.

⁸ Proc. of Med. Soc. of Co. of Kings, Aug. 1878.

⁹ Ibid., May, 1880.

¹⁰ A Medical Formulary, by L. Johnson, M.D., 1881, p. 290.

¹¹ In the practical manufacture of peptones Chapoteaut finds that one part of pepsin digests fifty parts of raw, lean, minced beef in fourteen hours at a temperature of 113° to 123° F.

much pepsin *could* do, but what it *would* do under ordinary conditions. I did not, therefore, mince the albumen in all cases, since it is in no such condition in the stomach; but cut it into thin slips or small pieces, or chewed it and then spat it into the digesting bottles. In nearly all cases I tested a number of pepsins at the same time. The solutions were put in receptacles of about the same size and shape, and were stirred at intervals of a half or one hour. The solutions were acidulated with hydrochloric acid to the extent generally of .5 per cent. of the concentrated acid.¹ Sometimes the amount was increased to 1 per cent. The latter is more favourable to artificial digestion, but the former is nearer the normal acidity of the gastric juice. Different amounts of pepsin, of acidulated water and of albumen were employed. To determine the actual work of the pepsin I took out all the undigested matter at the end of a certain number of hours and dried it. It was then partially dried, weighed, and compared with the original amount. Such a method does perfectly well for comparative experiments and to test the practical working of the ferment. It assumes that all the dissolved matter is digested. This I believe to be essentially the case, for reasons which will be shown further on. I do not mean to assert, however, that the dissolved matter is all peptone.

I used in all cases as a test the ordinary digestive one. The test of pepsin by its power to coagulate milk is of no value. Similarly the chloride of sodium test is, I believe, not a reliable one.²

EXPERIMENTS.

SERIES I. No. 1.—Took water acidulated with HCl .5 per cent., $\bar{3}$ ss.

Pepsin (American), gr. v.

Coagulated albumen, cut into small strips, gr. xx.

Kept at temp. 80° to 100° F. for 12 hours.

Result.—Slight disintegration with gelatinous appearance on the edges of the strips.

No. 2.—Same result.

No. 3.—Substituted raw beef for albumen. About same result.

No. 4.—Substituted cooked chicken, white meat, for albumen. Same result.

The water was not sufficient, nor the temperature high enough to make these results of value alone.

No. 6.—R. Lean beef cut into fine strips, $\bar{3}$ ss.

Pepsin (Keesby and Mattison's), gr. x.

Acidulated with HCl .5 per cent., $\bar{3}$ iv.

M. Kept at temp. 100° F. for 4 hours.

No. 7.—Same.

No. 8.—Same, but substituted Fairchild's pepsin (old preparation).

¹ There would be a slightly less amount of the free acid.

² See discussion on this subject, Proc. of Medical Soc. of Co. of Kings, Aug. 1878.

Result.—The strips of meat swelled up, became somewhat gelatinous, but no absolute disintegration.

SERIES II.—Took pepsin of various kinds, gr. x.

Water acidulated with HCl, conc. .5 per cent., $\bar{3}$ ij.

Albumen coagulated, cut into long and narrow strips, gr. xxx.

Put at temp. 100° F., shaken every hour, kept in 8–9 hours.

Results.—At the end of 4 hours considerable changes; swelling, softening, some disintegration.

At end of 8 hours there was left of dried albumen (which contains about one-half as much water as coagulated albumen) the following amounts:—

				Dried Albumen.
(a)	In solution containing	Hawley's pepsin,		gr. j.
(b)	“ “ “	Merck's (not pure) pepsin,		gr. j.
(c)	“ “ “	Boudauldt's “ “		gr. ij.
(d)	“ “ “	Merck's (pure) “		gr. v.
(e)	“ “ “	Fairchild's, in scales (old preparation) pepsin,		gr. j.
(f)	“ “ “	Wyeth's pure pepsin,		gr. viij.
(g)	“ “ “	Lacto-peptin,		gr. xv.

Special Preparations.

(h) R. Fairchild's essence of pepsin, $\bar{3}$ ij.

Aquæ, ad $\bar{3}$ ss.

Albumen coagulated, gr. x.

M. At temp. 100° F. 8 hours.

Result.—A slight amount of softening only.

(i) R. Caswell & Hazard's lime juice and pepsin, $\bar{3}$ ij.

Aquæ, ad $\bar{3}$ vj.

Coagulated albumen, gr. x.

M. At temp. 100° F. 8 hours.

Result.—None apparent.

(k) R. Lacto-peptin, gr. x.

Albumen, gr. xl.

Aquæ acidulated with HCl .5 per cent. $\bar{3}$ vj.

M. Temp. 100° F., 8 hours.

Result.—Slight diminution in bulk apparent.

(l) R. Fairchild's pepsin (old preparation) in scales, gr. iiij.

Albumen, finely cut, gr. x.

Aquæ acidulated with HCl .5 per cent., $\bar{3}$ vj.

M. Kept at temp. 100° F. $8\frac{1}{2}$ hours.

Result.—Albumen all dissolved.

(*m*) R. Wyeth's purified pepsin, gr. j.

Albumen, gr. x.

Aquæ acidulated with HCl .5 per cent., $\bar{3}$ j.

M. Temp. 100° F. 4 hours.

Result.—Dried albumen, gr. ij.

The above experiments gave less than standard results. This was partly due to the albumen being cut up, not mashed or minced finely, and not stirred frequently.

They show (1) that only slight results can be gotten from pepsins unless every precaution is carried out. (2) That the different pepsins have different values. (3) That lacto-peptin and the so-called essences and elixirs of pepsin are feeble preparations.

SERIES III. No. 1.—Took coagulated finely cut albumen, gr. xxx;

Aquæ acidulated with HCl .5 per cent., $\bar{3}$ vj.

Pepsin (Hawley's), gr. xx.

M. At temp. 100° F. 6 hours.

No. 2.—The same, with gr. iij Boudauldt's pepsin, instead of gr. xxx of Hawley's.

Results.—In (1) gr. vj dried albumen.

“ (2) gr. xv “ “

The above experiments were to see whether an increased amount of acidulated water or pepsin would increase the effect. As far as they go they show that more water does not increase the result much, while more pepsin does. This latter agrees with the results of others. The effect of increased dose is not greater in the same ratio, however.

SUPPLEMENTARY.—At same time with above, tests were prepared in strict accordance with a label.

(*a*) R. Pepsin (Sheffer's), gr. x.

Albumen (coagulated and finely cut), gr. 140.

Aquæ acidulated with HCl 1. per cent., $\bar{3}$ j.

M. Kept at 100° F. for 6 hours.

Results.—Almost nothing; hardly any change perceptible.

(*b*) Same as (*a*), but reduced albumen to gr. xx.

Result.—In 6 hours albumen partly dried, gr. x.

(*c*) Same as (*a*), but increased acid. aq. to $\bar{3}$ iv.

Decreased pepsin to gr. v.

Result.—In 6 hours albumen partly dried, gr. xl.

To test effect of larger dose and more acidulated water:—

(*d*) R. Aquæ acidulated HCl .5 per cent., $\bar{3}$ iv.

Coag. albumen, gr. 120.

Pepsin (various kinds), gr. xl.

M. Kept at 100° F. 6 hours.

Result.—Albumen partly dried, gr. 80.

Sheffer's, Boudauldt's, Wyeth's, and Merck's were equally mixed.

SERIES IV.—R. Pepsin, of various kinds, gr. x.

Aquæ acidulated with HCl .5 per cent., $\bar{3}$ ij.

Albumen (finely chopped), gr. 120.

M. Kept at temp. 100° F. 5 hours.

1. *Result.*—With *Sheffer's* pepsin albumen, partly dried, weighed, gr. 40.

2. *Result.*—With Keasby & Mattison's, gr. 60.

3. *Result.*—With Fairchild's old preparation, gr. 50.

SERIES V.—Took eight different kinds of pepsin and made a mixture as follows:—

Pepsin, gr. x.

Aquæ acidulated with HCl .5 per cent., $\bar{3}$ ij.

Albumen coag. (chewed and then spat out), $\bar{3}$ ij.

Kept at a temp. 110° F. for 6 hours, stirred q. 1 hour.

The albumen left was then put on a filter paper, dried, and weighed, with the following results:—

In mixture with Beal's pepsin, gr. viij.

“ “ “ Boudauldt's pepsin, gr. xij.

“ “ “ Sheffer's “ gr. xxv.

“ “ “ Merck's* “ gr. xxi.

“ “ “ Frinzuber* “ gr. x.

“ “ “ Fairchild's* (new) pepsin, gr. xxiv.

“ “ “ Hawley's pepsin, gr. xxv.

“ “ “ Witte's* “ gr. xix.

In those marked * the dose is, gr. 1–3, and they are called “pure.” The claims of all are that gr. j to gr. x will digest gr. 150 to gr. 225, or even gr. 500 of albumen in 4–6 hours.

From the above experiments it seems possible that most could do it if the albumen were minced finely, frequently stirred, and the HCl was in proportion of 1 per cent.

Supplementary trials of Fairchild's and Witte's pepsin, for which much is claimed:—

(1) R. Fairchild's pepsin (new), gr. x.

Acidulated water with HCl 1. per cent., $\bar{3}$ v.

Coagulated albumen, finely cut, gr. 240.

M. At temp. 100°–110° F. 3 hours, stirred quietly 1 hour.

Result.—About gr. 60 dried albumen left.

(2) R. Witte's pepsin, gr. x.

Aquæ acidulated with HCl 1 per cent., $\bar{3}$ iv.

Coagulated albumen (chewed), $\bar{3}$ ij.

Result.—In 3 hours at 100°–110° F. about gr. 60 dried albumen.

(3) Same as (1), only the albumen was chewed.

Result.—Gr. x partly dried albumen. This was the best result ever obtained.

(4) Took Fairchild's pepsin scales, gr. v.

Acid. hydrochloric. .5 per cent.

Aquæ, $\bar{3}$ v.

Lean mutton cut and chewed, gr. 120.

Coagulated egg albumen cut and chewed, gr. 380.

(5) Same mixture, except that Sheffer's pepsin was used.

Kept both at temp. of 102° to 110° F. for five hours, and stirred about every half hour.

Result.—In experiment (4) gr. 420 of partly dried residue; in experiment (5) gr. 480 of partly dried residue.

(6) Took Hawley's pepsin, gr. x.

HCl .5 per cent.

Aquæ, $\bar{3}$ v.

Broiled tenderloin, cut and finely chewed, gr. 480.

Kept 4 hours at 102° to 110° F., occasional stirring.

Result.—Weight of partly dried residue, gr. 440.

SERIES VI.—Test of Extract of Pancreas (Fairchild's).

Took gr. x pancreatin.

“ $\bar{3}$ j aquæ with HCl 1. per cent.

“ gr. x Fairchild's pepsin.

M. Kept at temp. 100° F. for 2 hours, then neutralized fluid with sodæ bicarb., and added $\bar{3}$ ijj to $\bar{3}$ iv milk. Did this with three samples. Kept the milk and pancreatin mixture at temp. 100° F. for 7 hours. No evidence of peptonization.

A few other special experiments were made to test the action of pepsins on lean meat, and the comparative value of two preparations used in later experiments. In mixtures made according to label in four experiments, using Hawley's and Boudauldt's pepsins, lean meat, cut into strips of moderate size, was swollen and softened, but hardly at all dissolved in five hours.

The above experiments appeared to me to show that *ten grains of ordinary commercial pepsin will generally digest ten or twelve times its own weight of coagulated egg-albumen, finely minced in four to six hours. It has, however, a very little effect upon lumps of albumen or upon boluses of lean or cooked meat.*

This is the case outside the stomach. If it does no better when given medicinally, or even if it does considerably better, its power as a remedy must be very slight.

Doubts regarding the efficacy of pepsin are quite prevalent among medical practitioners.¹ But on the whole, the clinical evidence is in favour of

¹ See especially Wood's *Mat. Medica and Therapeutics*, 3d ed., Art. Pepsin.

it, as shown by the immense demand, and by the many testimonials in text-books and journals.¹ I have certainly had cases under my personal observation which showed that it had positive value. The great variation in the quality of pepsins, and the ignorance of the proper way in which to give them, will explain some of the failures in its use.

I wished, however, to discover if possible, by actual observation, whether pepsin, given medicinally, has not a much greater power than would be inferred by its action in digesters. There are physiological reasons for supposing that it has. But, after all, a physiological hypothesis is a poor substitute for a demonstration. This latter is what I have sought.

I therefore took a large number of dogs, fed them upon certain fixed quantities of food, giving pepsin with the food to some, but only the food to others. They were then killed, and the condition of the food noted.

I am aware of the opportunities for error in such experiments, and will discuss them and show that they were as nearly as possible met.

First, the experiments were on dogs, not human beings. But man is more of a carnivora than omnivora. Stomach digestion in the dog, as compared with intestinal, is of somewhat greater importance than it is in man. The ratio of the length of man's intestine to his body is about 1 to 6; of dog's 1 to 5-6; of herbivora's 1 to 12-28.² The ratio of the superficial area of stomach to that of intestine in man is 20 to 100; in carnivora 19-28 to 100.^{3, 4} The dog's stomach is relatively a little larger than man's therefore. But the gastric glands and juice are essentially of the same character. Digestion reaches its height in about two hours⁵ in the dog, it then gradually declines. Gastric digestion in the dog is on the whole a little slower than in man, and of a little more relative importance. But the difference is not great.

Second. The experiments would have value only in one direction. If no results were obtained, no positive inference either way could be laid down. Positive results, however, would have a real value, being obtained against serious obstacles.

Third. The individual results would depend upon the size, health, age, etc., of the different animals. The dogs, therefore, were carefully chosen, were of about the same size, and were deprived of food for twenty-four hours.

Fourth. The same pepsins would have to be used. This was done.

Fifth. The experiments were made on animals with healthy stomachs.

¹ Dr. Sanford furnished some positive clinical evidence of its value in a discussion before King's Co. Med. Soc. *Vide* Proc., Aug. 1878.

² J. Munk. *Physiol. des Menschen und Säugethiere*, p. 140. Berlin, 1881.

³ In a dog weighing twelve pounds I found the small intestine twelve feet long, the large intestine one foot and a half. Capacity of stomach, 3xij.

⁴ Custor, J., *Marburger. Sitz. Ber.* No. 7, Oct. 1879.

⁵ Schmidt-Mulheim, A. *Archiv für Anat. and Phys.*, 1879, p. 39.

But if pepsin shows an extra activity here, we can justly infer that it would do the same in dyspeptic stomachs. However, I performed some control experiments upon animals with a presumably artificial dyspepsia produced by morphine.

As food, coagulated egg-albumen and lean meat were used. After the animals were killed, the contents of the stomach were carefully collected, pressed upon filtering paper, weighed, and the weight compared with that of the original amount.

I should add that the animals were all condemned to be drowned, so that no cruelty or unnecessary loss of life was involved.

From the following table it will be seen—

(1) That in 21 dogs to whom were given 384 of albumen and lean meat, and *gr. 240 of pepsin*, there were digested 363 gr. 17, or about four-fifths of the whole, or on an average 3iiij gr. xij for each dog, within one and three-quarters to three and a half hours.

(2) That in 10 dogs of Series I. V. VI., to whom were given 340 of albumen and meat *with gr. 130 of better pepsin*, there were digested 334 gr. 27, or about seven-eighths of the whole, or an average of 3iiij gr. 50 for each dog.

(3) That in 15 dogs, to whom were given 360 of meat and albumen, *with no pepsin*, there were digested 321 gr. x, or a little over one-third or about 3j gr. vj for each dog.

This gives a difference of from 126 to 158 grains in favour of the pepsin for each trial. Furthermore, the digestion was all done *within three hours*, or three and a half in a few cases. It is to be remembered, also, that the albumen was not cut up, and was only coarsely broken by the dog's teeth. The meat was in a solid mass.

Now *it is impossible* for any commercial pepsins in ten or fifteen grain doses to digest the above amount of *unminced* albumen, outside the stomach, except possibly after twenty or thirty hours. Even if minced, it could not do it within three hours.

The above dose of pepsin *will make hardly any impression* on beef, rare or cooked, when given as above, in three or even six hours.

I think it can be fairly inferred, therefore, that I have demonstrated an extra activity of medicinal pepsins when in the stomach.

It is not easy to produce by statistics the impression made by personal observation of the stomachs. I often saw the mucous membrane, in the vicinity of the pepsined meat, of a fiery-red colour, but never saw it so marked about the non-pepsined food.

In my second and third series the pepsin action seemed to have become much less. It finally occurred to me that the pepsin, though of the same brand, might not be so active as at first, especially upon meat. I changed the pepsin and at once got such marked results that it seemed unnecessary to make further experiments. I have, therefore, for the first, fifth, and last series, made a separate estimate.

Tabular Record of Experiments to Test the Activity of Commercial Pepsins in the Stomach.

Series.	No. of dogs (full grown) with weight.	Kind and amount of food.	Time allowed for digestion.	Kind and amount of pepsin.	Contents of stomach, aside from the food and pepsin.	Weight of food at end of digestion.			
						When given <i>with</i> pepsin.	Amount digested.	When given <i>without</i> pepsin.	Amount digest'd
I.	No. lbs. 1 10	Coagulated egg, album. 5ss	3 hrs.	Hawley's gr. x	Empty	gr. ij (almost gone) a few "floculi."	gr. 238		
	2 10	"	"	"	"	.....	.....	5ij (not much apparent change)	gr. 60
	3 15	"	"	"	"	.....	.....	5ij "	gr. 60
	4 12	"	"	"	"	gr. ij	gr. 237		
	5 15	"	"	"	"	gr. ij	gr. 238		
	6 12	"	"	"	Hair and foreign substance	gr. xl	gr. 200		
II.	7 12	"	2½ hrs.	"	Some bread	.....	.....	5i	gr. 180
	8 12	"	3 hrs.	"	"	.....	.....	5iv (hardly any percept. ch.)	0
	9 12	Raw lean meat 5ss	"	"	Empty	.....	.....	5iv (hardly any percept. ch.)	0
	10 12	Coag. egg alb. 5ss	"	"	"	Only traces (floculi)	gr. 240		
	11 10	Raw lean meat 5ss	"	"	"	"	gr. 240		
	12 8	Coag. egg alb. 5ss	"	"	"	5iv (hardly any change)	0		
III.	13 15	"	"	"	"	5iiss	gr. 90		
	14 12	"	"	"	"	5ij	gr. 120		
	15 15	"	"	"	"	.....	.....	5iv "	0
	16 10	Raw lean meat 5ss	2½ hrs.	"	Hairy masses	5ij (much foreign matter)	gr. 60		
	17 12	"	"	"	"	5ij	gr. 160		
	18 12	"	"	"	Empty	No traces; vomited?			
IV.	19 15	"	"	"	"	.....	.....	5ij	gr. 120
	20 12	"	"	"	"	.....	.....	5j-gr. xij	gr. 183
	21 10	"	"	"	"	.....	.....	5j-gr. l	gr. 130
	22 16	"	3 hrs.	"	"	gr. l	gr. 190		
	23 16	"	"	"	"	.....	.....	gr. l	gr. 190
	24 12	"	"	"	12 lumbricoid worms	5ij	gr. 120		
V.	25 20	"	"	"	Empty	gr. xx	gr. 220		
	26 15	"	2 hrs.	"	"	.....	.....	5ij	gr. 60
	27 15	"	"	"	"	.....	.....	5ij-gr. xl	gr. 20
	28 10	"	"	Bou- dault's gr. xv	"	5j-gr. xx	gr. 160		
	29 9	"	"	"	"	gr. xv	gr. 225		
	30 15	"	2½ hrs.	Also gr. ¼ morph. sul.	"	gr. xlv	gr. 195		
VI.	31 9	"	"	"	"	.....	.....	5ij	gr. 120
	32 9	"	"	"	"	.....	.....	5ij	gr. 120
	33 8	"	"	"	"	Only traces	gr. 240		
	34 8	"	"	"	Mass of foreign matter.	5l-gr. xij	gr. 167		
	35 12	"	"	No mor- phine	Empty	.....	.....	5ij- gr. xvj	gr. 102
	36 15	"	1½ hrs.	Keasby & Mattison's gr. x	"	gr. xl	gr. 200		

In conclusion: A physician in giving a dose of *good* pepsin may believe that it will have a value two or three times greater than that exhibited under ordinary artificial conditions, *i. e.*, it will digest twenty or thirty times its own weight. This conclusion is in harmony with much clinical experience, that *good* pepsin has a *real* though not a *great* medicinal value.

Points of practical importance are, that large doses should be given, even of so-called pure pepsins. The physician should always know how much pure pepsin there is in the saccharated preparations. Acid should generally be given immediately before, and the pepsin after meals.

ARTICLE II.

RHEUMATIC LEUCÖINOITIS OF THE PULMONARY AIR-TUBES, AND RELATING ALSO TO THE PNEUMONIA AND SOLID ENGORGEMENT SUPERVENING THEREON. By THOMAS H. BUCKLER, M.D., of Paris, France.

BESIDES the large amount of exact knowledge bequeathed by Laennec to the medical world at large, he left to observers and searchers after truth a residuary estate, in order that they might make out of it what they could in the following enigmatical words:—

“Pulmonary catarrh is incontestably one of the most frequent of diseases; few persons pass a year without an attack. Yet it is, perhaps, less understood than any disease of rare occurrence. . . . Even the nature of catarrh may still be a matter of doubt.”

Speaking of the pathology of bronchitis, he again says (p. 61):—

“The extent and intensity of the redness do not bear a uniform proportion to the violence of the inflammation, the amount of the expectoration, and the acute character of the disease. . . . In very acute idiopathic catarrh, the bronchial mucous membrane presents traces of inflammation in some points only.” And again, commenting on the 14th and 16th observations of Andral, Laennec says: “In both the bronchi were extremely pale. In neither was there any other cause of disease or death observed; so true is it, that besides the light pathological anatomy is capable of throwing on these cases, and it is unquestionably strong, we must seek for other light of an entirely different kind.”

Speaking of the viscid character of the sputa in dry catarrh, he further says:—

“Art possesses resources which, though not, indeed, infallible, are at least successful often in diminishing the viscosity, and rendering the sputa more liquid. This assertion, which will, perhaps, appear to be founded on the antiquated humoral hypothesis, certainly neither belongs to myself nor the present time. . . . But I can affirm that I have procured great and lasting relief in many old and severe cases of dry catarrh, by the exhibition of medicines which the humoral and chemical physicians for the past three centuries considered efficacious in correcting the viscosity of the humours.”

Laennec evidently thought that before a right understanding of this matter in discussion could be arrived at, and the mystery cleared up, a

key to the enigma must be found in the discovery of some new truth, without which the obscure problem could never be solved.

My attention was called to the foregoing words of Laennec forty-seven years ago, the year I graduated in medicine, and I determined, if possible, to complete that part of the work which he had left unfinished. My first step was to inquire what the books on diseases of the lungs, systematic authors, and medical dictionaries defined bronchitis to be, and I found, without exception, that their definition was: "Inflammation of the mucous membrane of the bronchi." I learned in the dissection-room that the air-tube works of the lungs are built up and constructed out of white fibrous tissue, and that the mucous membrane, the sole seat of bronchitis, according to the books, is only their thin inner lining. This being the case, the bronchi proper, composed of white fibrous tissue alone, are the only structures of the body regarded as not liable to disease of any sort, and thus far have been utterly neglected by etiologists, pathologists, and scientific therapeutists.

I then decided to make this entirely disregarded fibrous tissue a subject of thought to find out if nothing ever went wrong with it, and determine if it really were true that the mucous membrane of the bronchi is the only part of those structures liable to disease; pursuing the inquiry, I found rheumatic inflammation of the white fibrous tissues of the bronchi to be a distinct entity, not only not described, but never even hinted at by authors. Eighteen years later I gave to the press a monograph of 150 pages on "Fibro-Bronchitis and Rheumatic Pneumonia," the former having reference to rheumatism seated in the white fibrous tissue of the bronchi, and the latter relating to the symptomatic engorgements, more or less solid, of the pulmonary parenchyma supervening thereon.

The rheumatic element related with the pathological state of the fluids was also considered from points of view never before regarded, while the supervening symptomatic engorgements of the pulmonary parenchyma and cardiac lesions were spoken of with especial reference to the idiopathic disease seated primarily in the white fibrous tissue of the bronchi.

When a new truth is dragged out of darkness and held up in the light, men, often to avoid the trouble of thinking, refuse to regard it as in anything different from what they have been taught, and are accustomed to. They may see far-fetched resemblances between conditions quite distinct and opposite; but when required to point out the differences, however glaring, they are as much at a loss as the colour-blind when asked to recognize, discriminate, and point out differences of shades or tints.

When I first spoke to my friend, the late Professor Power, about rheumatic fibro-bronchitis, endeavouring to explain to him that it was a distinct entity, and that successful practice rendered it indispensable to regard it in that light, he said: "How is it then that, during an attendance of two years on the services of MM. Louis, Andral, Chomel, and Gris-

solle, I never heard them say a single word about any such disease?" For three years I talked on this subject without getting him to admit that there was any such thing as symptomatic or idiopathic inflammation of the white fibrous tissues of the bronchi, in supervening symptomatic pneumonia engrafted thereon, or, in fact, any morbid condition about or in the lungs that had not already been described by one or all of his great masters. Finally, the last winter he lectured, he came to me and said: "I want you to go with me and see a man at the infirmary. I don't know what is the matter with him, except that he has fever, with a very distressing cough, and his case may be one of the kind you have been talking to me about."

CASE I.—I went and found a previously healthy man, about twenty-two years old, who had gotten sick from sleeping in cold, wet clothes. He had a hot, dry skin, relieved by occasional gushes of perspiration and a paroxysmal cough, so loud that to avoid annoyance to the other patients in a large ward, he was moved to a private room. The details of this case were carefully noted from day to day, but the record being handed round from one to another was finally lost, and when I wanted it to publish in the monograph already referred to, could not be found. Suffice it to say, that careful examination of the chest furnished, through ear and touch, no sign whatever of anything wrong. And, accordingly, there being no rheumatism in other parts of his body, the case was pronounced by exclusion to be a typical example of acute idiopathic rheumatism seated in the white fibrous tissues of the right bronchi.

Two days later he was seized with acute rheumatism in the right shoulder-joint, where it continued about thirty-six hours, during which period there was no cough whatever.

Then there was retrocession of the rheumatic principle back to its primary seat in the bronchi, with renewal of the cough. Next it took partial flight to the endocardium, giving rise to thickening and insufficiency of the mitral valve, made evident by murmur with the first sound.

Then, after several days, came on pericarditis, indicated by friction-sound and a hobbling intermittent pulse; but all this time the major part of the rheumatism remained in the fibrous tissue of the bronchi, where, over twenty days from the date of attack, it gave rise to a very persistent pneumonia of that impacted and solid kind which only happens when engorgement is symptomatic of rheumatism seated in the white fibrous tissues of the air-tubes, and surrounds one or many of the bronchi labouring under that disease. At the end of about three months the man was discharged well and sound, with the exception of slight hypertrophy and a pronounced murmur with the first sound of the heart.

This example accomplished what three years of earnest precept had failed to do. Professor Power saw that this was a case which no writer had ever yet described, that idiopathic, mute, or fibro-bronchitis and supervening symptomatic pneumonia engrafted on it were new and distinct entities, not only not represented in words, but not even hinted at by any author, ancient or modern, and that a new and heretofore unknown labyrinth of etiology, symptomatology, and pathology was here entered to be opened up, explored, and made plain.

Shortly after the monograph already referred to had been published, or during the year 1854, I saw in the *Edinburgh Medical Journal* a paper by Dr. Black, wherein he says that, in examining the air-tubes microscopically, he had discovered crystalline particles of uric acid and urate of soda deeply imbedded in thin white fibrous tissues.

Did not the discovery of uric acid crystals imbedded in the white fibrous tissues of the bronchi signify that these structures had been neglected, and that their diseased conditions needed to be attended to by etiologists, pathologists, and therapeutists?

This triumph of Dr. Black, in dragging these particles from their dark hiding-places, and holding them up to the profession in a clear light, is, in a scientific point of view, quite as remarkable as the discovery of Virchow, when he showed the mode by which emboli floating in the circulation are carried into the arteries, plugging them up, and producing in different organs the destructive effects he has so well described. But, when considered from a utilitarian and life-saving point of view, the discovery of Dr. Black, properly appreciated, is altogether the most valuable of the two, since crystals of uric acid, urate of sodium, and the triple phosphates may, by the use of appropriate solvents, be dissolved out from their hiding-places, thereby removing the splinters from vital structures, and saving the lives of patients that would otherwise, beyond peradventure, die. Whereas, for the mischief caused by emboli there is little or nothing to be done.

Having lost the assistance of Prof. Power, I decided to take no further steps until I could see published in the journals or elsewhere, some case illustrating this peculiar entity, and it is pleasing to relate that Dr. William P. Bolles has given evidence that he possesses an acute mind and rare powers of observation by publishing in *The Boston Medical and Surgical Journal* for February 3, 1881, under the modest heading of "Causes of Pneumonia," the three examples, exactly illustrating some phases of the subject, here reproduced, showing that they must have been, since he says nothing about previous rheumatism in other parts of the body, examples of idiopathic fibro-bronchitis with supervening, intercurrent, or symptomatic pneumonia, leaving the reader to adopt the participle or adjective synonym in his judgment best suited to express this peculiar engorgement. The following cases of Dr. Bolles are here reproduced to illustrate the precepts sought to be inculcated.

CASE II.—The patient was a store-house keeper, twenty-nine years old, and married. There was no consumptive taint in his family, and up to 17th of June, 1875, he was perfectly well. On this day, after watching a procession, he became very chilly, and had what he described as a terrible cold, with hard cough, pain in the left side, and a good deal of fever. He was laid up for a few days, and afterwards resumed his work. As the cough did not abate, he got some transient medical advice. When he came to me nine or ten weeks later he had lost flesh, was sweating at night, had a loud and hard cough, and felt weak. His appetite and courage were good, and he protested that there was nothing the matter with him but a cold.

I was surprised to find his temperature 102° F. (his pulse was about 100), and to find the signs of pneumonia in the lower lobe of the left lung—in the stage of resolution—dulness and coarse râles; no trouble elsewhere. His night-sweats disappeared under the use of ergot. He improved for a year, worked at his business most of the winter, went to the mountains in the summer, was better the next fall, failed the next spring, and died about two years from the time when I first saw him, after breaking down in both lungs and frightful hemorrhages.

This would have been far more conclusive as an instance of lobar pneumonia eventuating in a chronic form, had I or some one seen him at the start and properly examined his lungs; but the history of previous health and sudden invasion after exposure, without predisposition to tuberculosis, was so positive that I am inclined to regard it as such. On the other hand, the extreme rarity of an inflammation of one entire lobe existing as an acute attack and allowing the patient to continue out of bed bears strongly against it, and it is not impossible that a catarrhal form existed from the first. Its origin in the lower lobe would be remarkable even in this case.

Case II. had a hard cough, which did not abate, and at the end of nine or ten weeks still a hard cough, unproductive I presume, although Dr. Bolles does not say it was dry, as it must have been if the white fibrous tissues, and not the mucous membrane of the bronchi, were the seat of the disease. Sweating always accompanies acute fibro-bronchitis and rheumatic pneumonia, attended by fever. The engorgement in the lower lobe of the left lung was probably symptomatic of and engrafted on pre-existing rheumatic inflammation in the bronchial white fibrous tissues of that lobe. We are left in doubt whether the rheumatism was idiopathic, commencing primarily in the bronchi, or symptomatic in the sense that it had transferred itself from a joint or some outside fibrous tissue to the lungs. Dr. Bolles, not having interrogated the morbid element on this point, renders the history incomplete and unsatisfactory. The probability is, there was other solid engorgement surrounding the central air-tubes, which neither suppurated nor underwent resolution, and in this favourable nidus a hitherto latent tubercular diathesis deposited the cheesy eggs, which, subsequently developing, and finally melting down, gave rise to the frightful hemorrhages from rhexis, or the actual breaking of some bloodvessels. Dr. Bolles's last explanatory alternative, "it is not improbable that a catarrhal form existed from the first," is accepted with the material and cancelling modification that the primary seat of trouble was in the white fibrous tissues, and not in the catarrhal mucous membranal lining of the air-tubes.

CASE III.—A young grocer sent for me June 20, having a day or two before had chills followed by very quick pulse and moderately elevated temperature. He had some cough, the cheeks were flushed as in pneumonia, the urine was diminished and dark, but his respirations were not more than 20 per minute, full and deep; the chest expanded and contracted perfectly, gave an exaggerated and tympanic resonance every where, and the respiratory murmurs were everywhere full—a little puerile—perhaps, but if he had appeared well I should have declared the lungs to be sound. He was far from well, though, and when I was first called had fallen into a state of collapse, which had alarmed his family and previous attendant into the belief that he was dying. From this gentleman I learned that he had had a cough, regarded by him as bronchitis, for six or eight weeks, but he had been always to his business, and never had any elevation of tempera-

ture. He had examined the lungs on the day before with the same negative result as myself and also examined them with me. It seemed to us both that the patient would die in a day or two, and that he probably had miliary tubercles.

On the fifth day, the third of my attendance, there is a spot of bronchial respiration and bronchophony, not very well marked at the inner border of the left scapula.

Next day there was slight dulness at the affected spot, and the signs above noted were more marked. And again, on the day following, râles could be heard over most of this side, behind, with slight dulness and some degree of bronchial respiration and bronchophony; not enough to hide, however, the spot first attacked, which presented evidence of complete solidification in the most typical manner. Occasional râles were heard upon the right.

On the third day after his chills (my first day) his temperature was about 103° F., and rose on the fifth to 103.5° F.; then it began to drop, and on the twelfth day reached 99° F. The pulse, starting at the same time at 136, reached 80 on the ninth day, and then began to rise again. The respirations were remarkable. When the pulse was 136 and the temperature 103° F. they were only 20; gradually rose in five days to an average of 30, and reached 20 again on the nineteenth day. He improved, as if getting over a lung fever, and had the appearance of convalescence at about this time.

On the twelfth day the following record was made: "There is slight dulness of the left front, with exaggerated respiratory murmur; no râles in front. Respiration and resonance of right side normal;" the tympanitic resonance noticed at first has disappeared. Râles and dulness in the middle left scapular region, as before; dulness doubtful below.

Fourteenth day. Back clearing; a little spot of solidification, with a few râles around left nipple (corresponding to the one in the back).

Then a little more trouble invaded the left base and left it again. On the whole, the lung seemed to be clearing, but the spot which first appeared never disappeared, now becoming larger, and again smaller, but always solid. On the thirty-sixth day, for instance, "a spot as large as the palm of the hand around the left nipple and a corresponding space behind were solidified; the apex was clear, and but few râles, with moderate dulness, were left below; nothing upon the right." The temperature and pulse were each about 100; the respirations not 25, generally below. He got better and out in the fall. The temperature kept most of the time below 100° F. The cough and greenish expectoration continued. He gained some flesh, at one time, but the lungs never cleared any more, nor changed much while I saw him. The winter was spent in Georgia, from whence he returned the next June to die.

The above case is valuable since it illustrates the metastatic character of this novel disease. To what maladies other than rheumatism and gout do these come-and-go, desultory, and vagrant habits belong? To none others. Rheumatism becomes visceral by flying from the periphery to the fibrous tissues of some central vital organ, or, originating in the latter, gets dislodged, and in turn becomes diffused to the fibrous tissues or joints of the muscular or locomotive system, gout going most generally to its legitimate provinces, the small joints of the fingers and toes. In the same way the rheumatic element once lodged in a lung may pass from one bronchus to another.

Dr. Bolles says: "Then a little more trouble invaded the left base and left it again." In the same sentence he further says: "The spot which first appeared never disappeared, now becoming larger, and again smaller, but always solid." In what other case or cases of pneumonia have like statements been made? Not that they have not occurred many a time, but the observers were not acute enough to notice them.

Engorgements suspended like the nest of a weaver bird, amid hanging bronchial branches, in which persistently or transiently the fibrous inflammation is for the time or has been most acute, is brought about and continued in those portions of the parenchyma having the nearest contiguity to the bronchi labouring under the greatest degree of rheumatic inflammation, which latter often undergoes metastasis from the white fibrous tissues of the bronchi, going from one set of lobules to that of others in the same lobe, in which case the engorgement is also transferred.

Sometimes the rheumatic element passes from the bronchi of one lobe to those of another, and rarely there is metastasis from one lung to the other, but here the rheumatic principle is most apt to make the endo- or pericardium its half-way house.

I quote the following from the monograph on Fibro-bronchitis and Rheumatic Pneumonia, page 65 :—

“But the point of most importance in this case is, that the pneumonia, having changed from the third or lower to the middle lobe of the right lung, furnishes actual proof of the metastatic character of the disease, and that a transfer of the inflammatory process may take place from one portion of the fibrous tissue of the bronchi to another, just as it is so often observed to do in like structures of the body generally. The cardiac murmur, which must have originated from the bronchitis, shows also very clearly the rheumatic character of the disease.”

Persistency of rheumatic inflammation in one set of air-tubes is apt to be accompanied by a very solid form of engorgement, forming in people of phthisical diathesis a very favourite nidus for the subsequent deposit of tuberculous matter.

Where fibro-bronchitis existing in a lobe varies in degree, engorgement in the parenchyma surrounding it increases or diminishes as the intensity of inflammation in the white fibrous tissues grows greater or less. This case presenting several interesting details is still deficient in many particulars, about which the reader might with profit have been informed. Nothing is said about the amount and character of the urine at different stages of the case, whether at one time it was charged with triple phosphates, or at another with uric acid and urate of soda. Nor is anything said about nitrogen or nitro-carbon in the blood. It would be interesting to know about the heart, and whether the lung trouble was preceded, accompanied, or followed by rheumatism in any of the other fibrous tissues of the body, and also when the respiration was infrequent while the pulse and temperature ranged high, whether there was antecedent or contemporaneous suppression of urine.

It is stated in the sequel of this case that a “well-developed cold” (Dr. Bolles does not explain the exact meaning he wishes to convey or have the reader attach to the term “well-developed cold”) “resulting from exposure in the spring was regarded as its origin.” What kind of cold was it, a *courbature*, a catarrh, or a rheumatism? Dr. Bolles also says that this young married grocer had been suffering six or eight weeks be-

fore he saw him with a cough regarded, by the gentleman who first attended him, as caused by bronchitis, defined by dictionaries and systematic writers to be "inflammation of the mucous membrane of the bronchial tubes," characterized by sibilant, sonorous, or subcrepitant rhonchi and râles, and frequently by all three sounds happening contemporaneously. Dr. Bolles does not say that he concurred in opinion as to the existence of bronchitis, since, on carefully examining, he found no signs of it, or indeed of anything else wrong with the lungs, as he says "the respirations were not more than 20 per minute, full and deep; the chest expanded and contracted perfectly, and the respiratory murmurs were everywhere full, a little puerile perhaps; but *if he had appeared well I should have declared the lungs to be sound.*" He further says, "the gentleman whose case it was had examined the lungs the day before with the same negative results."

Now the point I wish to make, and the truth I desire to declare is this, that had lecturers and systematic writers on the lungs recognized and taught the entity of fibro-bronchitis or rheumatic inflammations seated in the white fibrous tissues of the air-tubes, distinctly pointed out to them in a monograph published twenty-nine years ago, Dr. Bolles and his consultant would at once have seen that these negative signs were by exclusion positive proof, not of a stridulous or blatant mucous bronchitis already and long ago defined by Laennec and others, but of a mute fibrous or rheumatic inflammation of the white fibrous or substantive tissues of the air-tubes.

Dr. Bolles was called to this case in *medias res*. There were things present, events that went before and sequences that must grow out of existing conditions, which latter might have been predicted had the true nature of the case been properly understood, and a real meaning of the symptoms intelligently appreciated from the first. To recapitulate and insist, the absence of all auscultatory signs furnished negative, but, by exclusion, conclusive proof of the existence of a fibro-bronchitis, while the antecedent history gave circumstantial evidence as to the probable existence of a phthisical diathesis which might never have cropped out had it not been provoked by the occurrence of fibro-bronchitis, the existence of which latter uncontrolled, unrecognized, and neglected would lead as a necessary sequence to intercurrent or symptomatic pneumonia, which, having been induced by and engrafted in long-continued inflammation of the white fibrous tissues of the air-tubes, is always, as observed by Dr. Bolles, more compact and solid than any form of parenchymatous engorgements resulting from all other causes. The great depression threatening dissolution when Dr. Bolles first saw the case was due to one or two causes, or probably to both, acting concurrently. The first cause of this extreme prostration was most likely an excess of nitrogenized matter in the blood, brought about by congestion of the kidneys and suppression of

urine as a consequence. A chemical examination of the latter at this time might have afforded much light, but apparently it was not made. The second cause of the alarming depression was no doubt due to loss of power in the pneumogastric nerve and in the cerebral zone, from which it takes its origin, engendered by the long-continued morbid irritation which a fibro-bronchitis of eight weeks' duration had continually caused. There is no condition of lungs or stomach more wearying to the par vagum than long-continued inflammation in the white fibrous tissues of the air-tubes. The neurasthenia thus induced may have had a great deal to do with the elaboration of the nitrogenized matters which were probably the immediate cause of the alarming depression at the time Dr. Bolles first saw him. Loss of power in the vagus rendering expiration incomplete was also the probable cause of the tympanitic resonance, and also of flatulence and indigestion, caused by debility in the sensitive branch of the vagus distributed in the mucous lining of the stomach. And that the infrequency of the respirations, when the pulse and temperature were high, was due to a wearied par vagum and to nitrogen, a depressant taking the place of carbon, the natural stimulant to respiration, there is hardly a doubt.

CASE IV.—Mr. M., a young man of twenty years, of excellent general health, took cold a week before sending for me, and went to church even, two days before, in the afternoon and walked out without an overcoat. On the next day he had chilly feelings, but no decided chill, followed by pain in the left side.

When I first saw him he was up and dressed, but feverish, with flushed face and steady cough. He complained moderately of the pain in his side, which was a dull ache; the expectoration was rusty and not abundant; the pulse was high, the temperature 104° F. Dulness and bronchial respiration were to be heard over the lower lobe of the left lung.

For the next two or three days he seemed moderately sick, very restless and uneasy, with bronchial respiration, dulness, and bronchophony, rusty expectoration and pain, much as at first; râles few and not prominent—at first none. Temperature 104° F., pulse 120, respiration 30.

On the sixth day from the chill, when all seemed to be going on well, he had a sharp attack of pleuritic pain, lasting into the next day, accompanied with a slight rise in the temperature and pulse, which had gone down several numbers, and a great rise in respiration to 40 per minute. He was not still a minute, but panted, coughed, and tossed the entire time.

Next day, he became quieter, and slept considerably; could lie upon the right side, previously only upon the back.

On the ninth day there was pain in the lower part of the right side. Examination showed roughened respiratory sounds throughout the right lung, with occasional coarse râles; broncho-vesicular respiration, friction sound, and slight dulness at the base, back, and side. Râles abundant everywhere in the left side, back, and front, excepting at the apex. They were coarse and clearing below; finer, with bronchophony in the middle portion of the back, where the dulness was most marked. Below there was more resonance than at time of previous examinations; moderately dull in front. Thus, as was to be expected, the lobe first attacked was already in process of resolution; but the trouble had advanced into the upper lobe on the left, which was partly solidified, and made a slight attack upon the lower part of the right. There had been local inflammations of both pleuræ, but no evidence of effusion into either pleural cavity.

On the tenth and eleventh day defervescence took place, and in spite of the active condition of the disease in the middle of the left lung, the temperature

dropped on the eleventh day to 98.4° F., the pulse to 92. The respiration kept up above 40. Although uncomfortable and nervous he appeared to be convalescent.

On the twelfth day he was examined, the result confirming entirely that of the ninth.

For several days there was very little change; he had a little pain all the time in the left side, sweat considerably at times, and was, as usual, restless and irritable. The cough was not, after the first five or six days, excessive; after the first week it diminished notably, and by the end of the second there was very little; the expectoration, too, was scant, or none.

Twentieth day. Short, dry, irritating cough.

On the twenty-second there was no change in the sounds of the left back from those of the twelfth. The front was becoming more dull; there were a few râles again at the extreme base of the right. He appeared somewhat better, and the tongue, which at first had been heavily coated, was quite clean; his appetite (for milk and liquids) had so far been very good. The urine, which had been high-coloured and scanty at first, but later quite normal, suddenly became very bloody, with disseminated corpuscles and albumen; it was so red as to be opaque in a four-ounce phial. There is and has been at times pain in the lower part of the right side; expectoration streaked with blood, not abundant; sputa mucous, very tenacious, clear, white.

Twenty-fifth day. Almost no change in the left lung; slight friction at base of right. The left front is becoming duller; tubular respiration and râles have advanced almost to the very top; scarcely any sounds can be heard in the middle of this lung, either in front or behind, in consequence of the almost complete absence of respiratory movement on this side. The scapular region is almost flat, and the voice sound approaches ægophony; right base still dull, with diminished respiration. The appetite has completely disappeared; he feels full and bloated; vomits. Urine still red. Dyspeptic, dull, and depressed.

Twenty-seventh day. The most intense dulness and bronchial respiration now are from the apex down along the sternal half of the chest; in front and the middle of the back coarse and gurgling sounds; elsewhere in front lower, and median regions behind clearer. The patient, who had begun to sit up ten days ago in a chair, has not been up for a week, is pale and cachectic, takes no solid food, strenuously objects to liquids.

Upon the thirtieth day pain appeared near the right saphenous opening, increasing by the next day to a high degree of severity, extending down to the calf, which is about as tender as the groin, and up along the right side. The leg was drawn up, and the slightest motion caused excruciating agony; when perfectly quiet it was sometimes comparatively comfortable. The tongue became dry on account of his panting and groaning, and the respiration rose to 48 per minute from the same cause. The leg was becoming œdematous. There was still no sign of clearing in the middle part of the lung, which had been solidified nearly a month. The breath was offensive. The urine, which had cleared itself nearly of blood, then (thirty-fifth day) suddenly became red again, with increase of vomiting and complete absence of appetite.

For nearly a month there had been very little expectoration. His cough, after the first week with a few exceptions, was never excessive, and much of the time he would raise only half a dozen mucous sputa in the course of the day; but suddenly on the night of the forty-first day, he began to cough violently, and continued for several hours, raising during this time fully four ounces of pure pus, creamy yellow and not tenacious. During the day following half as much more came up, and on successive days a still further quantity. The leg continued swollen and unmanageable, but less painful.

On the forty-fifth day began to eat a little; on the next raised more pus, ate a fair supper, and went without injections.

The right side was nearly normal. Left front, bronchial respiration at apex four fingers' breadth; broncho-vesicular with râles in the middle of the chest; very little sound below the nipple; resonance dull above and below, good in the middle, a little tympanitic if anything under the third rib; behind the respiration was vesicular, with râles below, bronchial, and very much diminished beneath the

scapula, with ægophony fairly marked above the middle; bronchial above. He coughed a good deal and raised much pus during the night; urine but little bloody; appetite very good.

From this time forth it is hardly necessary to follow his improvement by daily records. He gained slowly and doubtfully for a while. There was another attack of bloody urine, with diminution of appetite, and a coughing spell upon the sixty-first day, during which he raised half a pint of pus; but in general he ate and slept well, gained every day a little, became cheerful and tractable, began to sit up about the fifty-fifth day, walked a little a week later, in which he was much hindered by his greatly swollen leg, and got out of doors in about three months. The left side is almost passive in respiration, has shrunk considerably, and the sounds therein are very much diminished.

There are no râles to be heard anywhere. The respiratory sounds are not loud, and are rather sluggish, but not otherwise abnormal in the right side; in the left they are still more faint, and in the scapular region are scarcely to be heard above the general muffled roaring everywhere in the chest. The voice sound and resonance are good everywhere except in this space; the front has cleared remarkably.

The irritability of temper noticed in the above case may have been in great measure owing to the nature of the disease. The variable signs, symptoms, and degrees of engorgement noted on the ninth, twelfth, and twenty-seventh days, could only have been due to the metastasis of rheumatism from the white fibrous tissues of one set of bronchi to that of others, followed by sympathetic engorgement of the surrounding parenchyma, the degree, duration, and solidity of this latter being governed by the intensity and changeful nature of the morbid principle which, resting in one set of bronchial branches, or flying to the fibrous tissues of other air-tubes, became fixed there for a longer or shorter period, and inciting the while by its presence more or less symptomatic hyperæmia, engorgement, or solidification of the neighbouring pulmonary parenchyma.

The bad breath noted on the thirtieth day was probably due to the firm pressure made by solid engorgement on delicate branches of the nutritious artery, whereby their circulation was cut off, causing gangrene in some lobule or portion of mucous membrane until pressure was removed, and the vessels released by suppuration taking place in the solidified mass.

Continuing comments on the condition of this patient the fortieth day from the date of attack, Dr. Bolles says: "His cough after the first week, with a few exceptions, was never excessive." In reply to this statement it is well here to remark that, after symptomatic pneumonia supervenes on the idiopathic fibrous inflammation of the air-tubes proper, the cough is rarely excessive because the engorgement bolsters up the bronchi, and during inspiration and expiration keeps them quiet, thereby affording the relief that is given to a joint labouring under acute rheumatism by keeping it still.

It is probable that the suppuration in the lung and the trouble about the groin were due to like causes. When the blood undergoing febrile degradation is largely charged with fibrin, the latter and albumen, being churned together by the action of the heart, form diminutive and larger rounded bodies about the size of ordinary pearls, which are generally to be

found in the right and left ventricles of patients who have died of acute serous or fibrous inflammations. A lodgment of one of these true emboli in a pulmonary artery may have incited abscess just as a rounded body of the same kind, by plugging up a branch of the external iliac or femoral artery, caused like trouble in the groin.

Dr. Bolles, in the concluding words of his comments, says: "The chief point of interest in these last three cases was the fact that at the early stage there was a very strong resemblance in the condition and appearance of the patients, and in the physical signs, *although there were certainly two and perhaps three quite distinct diseases.*" But he does not say or utter even a conjecture as to the seat and nature of these diseases. He regrets in the first two cases the absence of an autopsy, but this, after phthisis had done its work of organic destruction, could have shed no light as to the nature of the primary entity or given the slightest information or hint in regard to the supervening symptomatic lesions which followed.

Clinical observations, with careful analysis of and reflection on the fruits thereof, will often furnish abundant light and knowledge, when examination of the same subject in the dead house finds them as inexpressive as a nameless grave.

As well might wood-ashes be examined to find out what kind of fruit the tree bore, or of what death it died. But, fortunately, in these cases the physical condition of the patients, the symptoms, and auscultatory signs are carefully noted, and the word-painting expressive or realistic, as artists would say. Thus recognition is rendered easy to one familiar with the general features of this family of morbid phenomena.

The primary disease in all these cases was rheumatism or mute bronchitis seated in the white fibrous tissues of the air-tubes. On this there supervened in all three cases at different epochs pneumonia, which, rendered persistent by sympathy with the contiguous fibro-bronchitis, sooner or later degenerated into solid engorgement, which, engrafted in Cases II. and III. on a phthisical constitution, became the nidus for tuberculous deposit, which ran into death, its usual disorganizing and destructive course. But Case IV. being entirely devoid of a tuberculous predisposition or diathesis, the engorgement ended in suppuration followed by carnification or adhesive inflammation of the lung-structures and consequent contraction of the left chest.

It is significant that Dr. Bolles should say in these cases so little about pain. Rheumatic inflammation in the white tissues of the bronchi is never characterized by or attended with pain. The par vagum, a nerve of peculiar sensibility, except when pressed upon by an aneurism or some other obstruction, telegraphs the instincts of hunger and thirst to the brain, but has no power to transmit to the nervous centres a sense of pain. Pain never under any circumstances points out the existence of leucöinoitis or white-fibre inflammation of the bronchi.

Having finished with the cases of Dr. Bolles, I here introduce two examples of the same disease, but presenting phases of a very different character: one a symptomatic case preceded by acute articular rheumatism in a man aged 57; the other idiopathic in a boy about 13, whose disease commenced primarily in the white fibrous tissue of the right bronchus.

CASE V. Acute Articular Rheumatism, Symptomatic Fibro-Bronchitis, Supervening Symptomatical Pneumonia, Pericarditis, Endocarditis, and Passive Engorgement from Retarded Circulation in the Lower Lobe of the Left Lung.—C. P., the subject of the following case, lasting, as will be seen, from early in April until late in October, 1874, seemed, when he first consulted me at Torquay, in 1870, being then 53 years old, to carry about him a great deal of superfluous fat, his face looking as if it were mainly composed of adipocere rather than of healthy flesh and blood. At that time he was annoyed by the trouble of coughing up every morning about a teaspoonful of blood. Examining his lungs with difficulty, owing to the superabundance of fat covering the walls of the chest, I discovered that the bleeding was caused by strumous¹ engorgement in the upper and middle lobes of the right lung, which, creating obstruction by pressure on the return pulmonary veins, causes blood to ooze out from their capillaries into the air-cells of the lower lobe, the lobules and entire structure of which were perfectly healthy and free at every point from strumous deposit. The difficulty of getting the blood up to the mouth arose from the long road it had to travel, and the loss of resilience in the upper lobes. I gave him a favourable prognosis, and told him he would know when the bleeding ceased that the morbid condition giving rise to it had recovered. Two years subsequently, when I next saw him, the infarction had entirely cleared up, and there had been no hemorrhage for more than six months.

About the 3d of April, 1874, his age being then 57, he came to say that seven physicians he had consulted all advised him to take a Turkish bath, and to ask if I would as a friend go and witness the operation, which I agreed to do under protest, since it was difficult to see how, with the feeble action of his heart, slow pulse, and leucophlegmatic countenance, he could react from the cold douche which would be given after he had gone through the sweating process.

Everything went well enough until the stream of cold water was dashed across the chest from left to right, when he recoiled and uttered a shriek of horror; the flagging current from the now withdrawn pipe passed down his right arm, leaving the skin covering it withered and cold. He was carried back into the sweating-room at a temperature of 110° Fahr., rubbed dry with hot towels, and friction applied to the arm, but all to no purpose. The functions of the musculo-spiral or cutaneous nerve of Wrisburg seemed to be entirely disabled. On reaching home an hour later, he took a glass of brandy to which he was unaccustomed, went to bed, and had the arm which was still cold wrapped in warm flannel. Up to this time I had found douches properly applied to suitable cases uniformly advantageous, and regard them as a most valuable therapeutic means.

The following morning the arm was preternaturally warm, but he was suffering anguish from acute articular rheumatism in the right shoulder-

¹ See in the American Journal of Medical Sciences a paper by the late Dr. Pepper, on Strumous Impaction of the Lungs.

joint. He had also sharp fever with heat and dryness of skin, which was relieved by occasional gusts of perspiration. At the end of about thirty-six hours there was retrocession of the rheumatic element to the white fibrous tissues of the right bronchi, giving rise to a paroxysmal and very distressing cough, which was relieved next day by metastasis of the rheumatic principle back again to the same shoulder, where it remained, with cessation of cough, two or three days, at the end of which inexact period it made a bolt back again to the bronchi with renewal of cough, followed about two days later by the fine crepitation of commencing pneumonia, heard at several points over the anterior and posterior surfaces of the upper two lobes, which the next day had passed into the stage of red engorgement, as shown by the tubal respirations, bronchophony, and dullness on percussion, to say nothing of the negative sign consisting in the absence of vesicular murmur. Some days later there was metastasis of the rheumatic element, which often divides itself, as it did here. A part went to the heart, giving rise to a pericarditis, while the remainder still clung to the bronchi, inciting and keeping up the surrounding parenchymatous engorgement, which day by day grew more and more solid.

On the 28th of April the following notes were taken: Pulse 126; respiration 33; pericardial friction sound very marked; some resolute rattle at summit of right lung heard above spine of scapula and below clavicle, and also on inferior margin of engorged middle lobe, which appears to have diminished in size, but not in solidity; pulse and heart sounds intermittent. Urine contains a moderate excess of all the usual salts, but gives no special indication for the use of a solvent for either urates or phosphates.

Some days having passed, murmur with the first and also with the second sound, together with roughness accompanying the former, gave evidence that endocarditis had set in. On the 22d of May the following note was taken: Pulse so hobbling and irregular that it is quite impossible to count it; engorgement in middle lobe still persistent, and occupies greater space, but in the upper lobe moist sounds are heard at several points, while at others healthy vesicular murmur has returned, marked murmur with first and second sounds of heart to be heard whenever in its irregular movements it acts with force; passive engorgement at base of left lung, caused by obstruction at the heart to the return blood. From this time up to the 22d of June, when I left him under the care of Dr. Herard, there was little alteration in the physical signs except that the engorgement in the middle lobe seemed at one time to occupy less and at another greater space. On the 20th of August, Herard, placing him under the care of the late Dr. Markheim, went off on his recreations. In answer to Mr. P.'s question, "What is my condition, and how do you regard my chances of recovery?" Herard replied, just before leaving, "Vous avez plusieurs maladies." On my return the 1st of Oct., Dr. Markheim said: "Of course we don't expect him to live more than a week or two, but must try something to relieve his painful hemorrhoids." I found the upper lobe clear; that the solid engorgement in the middle was undergoing resolution; that the passive engorgement at the base of the left lung had nearly disappeared; all the heart's sounds, morbid and normal, improved; and that the intermissions of pulse were now regular, and returned at uniform intervals. In one month thereafter he drove out, and eight years having passed, his mortuary is as good now as that of any other man of his age, besides which, it may be mentioned, he has a complexion most young women might envy.

The rheumatism in this case seemed to be neither incited nor kept up by the presence of any dominant salt, and hence it had to wear itself out. The bad cachectic condition of his habit and the presence in the blood of extractive matter for which there is no solvent may have had a great deal to do with its origin and continuance. If its incidents and variations had been noted from day to day, the details, including treatment, would fill a printed octavo volume. In regard to the latter, suffice it to say that, pending the disabled condition of his heart, covering a period of over two months, he took thrice daily powdered digitalis, gum *fœtida*, and squill, of each a grain combined in a pill; the *fœtida* was given to relieve emotional disturbance, of which there was a good deal, digitalis to tone the heart, and squill to keep the kidneys free; and for the engorgements, he must have taken at intervals, for a still longer period, every eight hours, half a grain of golden sulphuret of antimony and two grains of gum guaiacum.

CASE VI. *Idiopathic Rheumatism of the most acute kind seated in White Fibrous Tissues of the Right Primary Bronchus, rapidly supervening Endocarditis causing distressing Cerebral Symptoms, and on the morning of the fourth day the fine Dry Rôle of Commencing Pneumonia symptomatic of the Fibro-Bronchitis, which, having commenced in the Primary Bronchus, had now extended to the White Fibrous Tissue of other Air-tubes, and exciting Inflammatory Engorgement in the Parenchyma surrounding them.*—The 27th December, 1879, is memorable in Paris as one of the coldest days of the bitter winter then experienced. On the morning of that day, when the mercury was at 10° F. and a biting north-east wind blowing at the rate of twenty miles an hour, the subject of this case, a youth, 13 years old wanting one month, having taken the usual meagre early breakfast of *café au lait* and bread, and being inadequately provided with wraps, was out from 10 o'clock in the morning till 2 P. M. in an old carriage through which the wind passed in just the right quantity for chilling one to the heart or spinal marrow. On returning, had no appetite for second breakfast; said when out, felt sleepy, and had only experienced the sense of coldness after getting within doors. He lolled about the house, took very little dinner, and went to bed early. The next morning I was asked to see him, with the following symptoms: Skin hot and dry, pulse 128; says he can't move his hands or feet, and that his arms and legs feel as if they were made of wood, which means on examination that he has total paresis of the upper and lower extremities, involving complete loss of both sensibility and mobility. Tongue white, respiration and heart sounds perfectly healthy; feels, when he moves his head quickly, slight fleeting pain about the temporal ridges of the frontal bone, but has no uneasiness or pain anywhere else. While waiting to see the outcome of this threatening condition, the family gave him sweet spirits of nitre and other febrifuge remedies.

29th. Has passed a restless night; slight delirium; rolls his head from side to side, and has a wearied expression of face. Pulse, respiration, tactile temperature, and sounds of heart unchanged, except that there appears to be with the systole of the latter a slight murmur.

30th. Had during the night constant delirium and hallucinations of a very painful character; rolling of head more rapid and unceasing; has a

dejected countenance and a look of great prostration ; eyes staring, and the upper eyelid drawn back as if the trochlearis were a short unyielding cord ; cornea and exposed parts of conjunctiva covering sclerotic have a dry, glazed look ; having no voluntary power, his body has to be moved like a log, and his limbs like sticks. Pulse 128 ; respiration 26 ; marked murmur with first sound of heart, which, aided by a precept of M. Chomel, makes me believe that the wandering, nervous delirium and hallucinations do not depend on primary mischief about the brain, but are sympathetic with and caused by reflexes from the cardiac inflammation, and now I am instructed what to do. Insomnia having continued over 60 hours, and fearing exhaustion of nervous energy from want of sleep, he has just taken 20 grains of bromide of potassium and two teaspoonfuls of Follet's syrup of chloral. At the end of two hours he is quiet, but not sleeping. Half the quantity of each drug given at first is again administered at 10 o'clock A. M.

31st. He had twelve hours' continuous sleep yesterday and at intervals during the night, except when disturbed for the first time by cough ; mind perfectly clear ; respiration 36 ; pulse 128. The fine, dry crepitant râle of commencing pneumonia is heard from summit to base of right lung, over its dorsal surface, and in front above and to the left of the right nipple. Paresis of arms and legs still absolute. The urine, which has been clear, is now heavily clouded with urate of soda and uric acid ; held up in a wine-glass to transmitted light, its cloudiness, on adding aqua ammonia, passed away, and it became clear and perfectly translucent ; ordered 15 grains of salicylate of sodium to be given every eight hours.

January 1. Over the dorsal surface of the right lung from summit to base, and in front about the centre of the middle lobe, there is dulness on percussion, tubal respiration, and bronchophony, with increased fremitus under palpation ; respiration 32 ; pulse 125 ; sparse rust-coloured sputa ; murmur with the first and second sounds of heart. This morning he had a twinge of rheumatism in the left knee-joint, the first sign of pain since beginning of the attack, and with it a slight return of volition to the muscles of left leg ; partial sensibility has also returned ; he is able to move the toes of the left foot.

2d. He wants the salicylate oftener than eight hours, feeling assured that it is doing him good ; request not granted ; coarse moist rattle of resolvent pneumonia from summit to base of right lung behind and a few bubbles to the left of nipple in front. Last night pain began in the right knee, and now there is more or less rheumatism in all the joints and fibrous tissues of upper and lower extremities, to all of which both sensibility and motion are restored, and he says that but for the pain, he could move them freely, as he does now the fingers and toes ; profuse sweating has continued without intermission since yesterday morning ; respiration 26 ; pulse 112 ; sputa very moderate in quantity, and shows no rust colours.

4th. All the signs and symptoms improved ; rheumatism most acute in right shoulder and arm ; sweating continues.

6th. No trace of rheumatism left ; doses of salicylate reduced one-half ; no thirst, but a great craving for food.

8th. He is fairly convalescent, and able to be propped up for a short time in bed.

When in the beginning of this case all the symptoms pointed to trouble about the brain, I was so fortunate as to remember two cases

reported by Chomel, in his Clinique, wherein he has the candour to confess that he treated them for meningo-cerebritis, but discovered after death that they both died of endocarditis, there being no trace of anything wrong about the brain or its investing membranes. The recollection induced me to await events, and it is most fortunate I was led to do so, since, if this case, as Chomel's two, had been treated for the brain, it, like them, would no doubt have proved fatal. Had the fine rôle of commencing pneumonia occurred on the first day, December 28, I should most likely have regarded it as idiopathic, and, treating it for pneumonia, the boy would not have lived long enough for the rheumatism to crop out; but, having written a monograph on fibro-bronchitis, and noted the chronology of supervening sympathetic engorgement, I knew that a pneumonia commencing as late as the fourth day could only be symptomatic of pre-existing acute rheumatism seated in the white fibrous tissues of the bronchi, and therefore that the patient must be treated, not for idiopathic pneumonia, but for the rheumatic bronchitis which had caused it, and accordingly I ordered and continued to the date of convalescence nothing but salicylate of sodium, which not only dislodged rheumatism from its hiding-place, in the right bronchus, but cured it when it became diffused, thereby dissipating and bringing to a close the symptomatic pneumonia which had become parasitically engrafted on the primary disease.

The reader must therefore perceive that this patient had to be treated, not for the apparent, but for a hidden, disease, and it must also be seen that the engorgement incited and held in sympathetic increment by the pre-existing fibro-bronchitis could not have recovered, and must have proved fatal had it been treated with the ordinary remedies for pneumonia; but when its foundation was cut away by dislodging the rheumatism from its primary seat in the adjacent white fibrous tissue, the engorgement, having no supports brought to its aid, surrendered and became dissipated.

And it is clear that the salicylate of sodium acted in virtue of the power it has of dissolving urate of soda and crystals of uric acid lodged in the white fibrous tissues of the bronchi, where they acted like so many splinters, not only causing inflammatory erythism in them, but inciting sympathetic engorgement in the contiguous pulmonary parenchyma.

The reader must see that the life of this boy depended on two contingencies: first, that the lesson contained in the recorded experience of Chomel in two like fatal cases had been remembered; and next, that when the fine crepitant rôle of pneumonia was heard on the fourth day I knew the engorgement this sound indicated to be symptomatic of, and dependent on, pre-existing erythimal inflammation in the white fibrous tissues of the air-tubes, and therefore that the patient could not have had applied the usual treatment for pneumonia without a fatal issue, and that the only hope lay in prescribing, not for the secondary lesion, but in treating the

idiopathic fibro-bronchitis, which gave origin, support, and persistency to the engorgement.

And as this boy's system, with its rheumatic diathesis, has proved a fine laboratory, wherein the happy effects of purely chemical remedies were clearly illustrated, it may be well to state that in July last, after being greatly heated in playing lawn-tennis in the broiling sun on a very hot day, and feeling dizzy, he cooled off by sponging his head for a long time with cold water. The following morning, after a restless night, his back, abdomen, and chest were covered with an erythematous rash, in spite of which he took his usual cold sponge-bath; after the bath, the spots, which had been red, but nowhere raised above the surface, assumed the appearance of purpura. Still, he felt well, ate his breakfast, and then took a drive in an open carriage, the morning being fair, but cooler than the day previous. Shortly after returning, about midday, he felt chilly, and of his own accord went to bed and to sleep. He waked up, after two hours' rest, feverish, and with a sharp pain in the left elbow-joint. On examination very little of the rash roseola was to be seen. The attempt to flex or extend the arm gave him extreme anguish, and it was evident that his case was nothing less than one of acute articular rheumatism.

Remembering the happy effects of salicylate of sodium in the dangerous case already reported, he was put on fifteen-grain doses of this salt every eight hours.

At the end of two days, having taken six doses, he was in no respect better, the pain still persisting in his elbow-joint, with increased heat and fever. His urine was then treated with aqua ammonia, and found to contain the triple phosphates in large abundance, clouding the urine as soon as the ammonia was added, and forming at the bottom of the glass a copious precipitate. The order was to stop the salicylate, and give the acid of two fresh lemons thrice daily, in the form of lemonade sweetened with sugar.

After the acid of four lemons had been taken, the rheumatism, having been in great measure dislodged from the elbow, was diffused with greater or less intensity to all the joints and fibrous tissues of his body, which was bathed in a copious sweat, the day being very warm. The following day, the fourth from the date of seizure, there was marked murmur with the first sound of the heart; rheumatism had, with one exception, left all parts of his body, including the joint of the left arm where it first appeared, and was now confined to the right elbow-joint, where, in spite of the lemon-juice, it continued all next day, accompanied by fleeting pains from joint to joint of the upper and lower extremities. On the morning of the sixth day the urine was again examined, and found copiously charged with uric acid and urate of soda, for which he took, as a solvent, twenty grains of phosphate of ammonia, which, causing these salts to entirely disappear, was the last dose given him. By night he could flex and extend his arms and legs

freely without pain, and there was no uneasiness in any part of his body; but there was faint blowing with the first sound of the heart. The following morning, the seventh from the date of attack, he went down to breakfast as usual, and in the afternoon witnessed a game of lawn-tennis.

In an etiological and therapeutical point of view, the foregoing case is very instructive. The first two days were lost by giving salicylate of sodium, which was not the solvent suited to his then condition; this synthetic salt never doing any good when the fluids are charged with the triple phosphates; but from the happy effect it had exerted eighteen months before in the same boy, I gave it without taking the precaution of first examining into the condition of his fluids. Next is shown the signal relief given to the rheumatism by the effect fresh lemon-juice exerted in dissolving and eliminating the phosphates, but as soon as these salts were replaced by uric acid and urate of soda, citric acid also became nugatory, and in turn these nitrogenized matters had also to be gotten rid of by their appropriate solvent, phosphate of ammonia,¹ which dissolving, and eliminating by the skin and kidneys uric acid and urate of soda, in the form of urate of ammonia and phosphate of soda, gave final and lasting relief.

I may add that, about one month ago, this same boy, enjoying at the time his usual feeling of good health, had a harsh dry cough, unaccompanied by fever or discomfort of any kind, and with a healthy respiration unattended by sounds from the air-tubes. Examination found his urine very turbid with earthy phosphates, which were entirely and speedily gotten rid of, with complete relief of cough, by the use of lemonade.

In the record of Case No. VI., it is especially worthy of note that there was not the slightest cough until the symptomatic pneumonia set in on the fourth day, after which the cough was slight, and the sputa very moderate in quantity. I attribute the absence of cough to the fact that the rheumatism in this case was seated in the right primary bronchus, which is fixed, motionless, and not disturbed, like the air-tubes lower down, by the movements of respiration. A joint labouring under rheumatism is often free from pain so long as it is quiet, but the least movement causes anguish. For the same reason, rheumatism in the primary bronchi excites no cough because they are at rest, but when that disease invades the air-tubes lower down, the movements of respiration, by disturbing them, excite the most vehement paroxysmal, intermittent, or continued coughing spells; and so sure is this sign, that any one, having a cough of the kind in the absence of an elongated palate, which might excite a like one, ought to be kept in the house and put on treatment for rheumatism, if for no other reason than to avoid a worse trouble that might, excited

¹ An agent introduced by me through a paper published in the *American Journal of Medical Sciences*, about thirty-seven years ago, and pronounced by Golding Bird, in the last edition of his book on Urinary Pathology, the best solvent of uric acid and its compounds.

by exposure, come in the form of supervening rheumatic pneumonia. I have seen but one other case like the foregoing, and confess I did not at the time understand its real character, nor see into its hiding-place. A fibro-bronchitis without cough must have the rarity of a sclerotitis without photophobia.

CASE VII.—After I began to write this paper, S., head butler of 23 Park Grove, Battersea Park, London, came here suffering with a severe cough. He is a man about forty years old, of florid complexion, active habits, temperate, very muscular, and has always enjoyed good health. I briefly give his case, because it not only presents a happy illustration of some points here discussed, but exhibits, at the same time, a choice sample of the late London fog endemic, which numbered so many victims. In answer to queries, he said, “I got this cough at the time of the great London fog, which happened nearly eight weeks ago; it has been all the time the same as I have it now. I went for three weeks as an out-patient to the Westminster Hospital, but at the end of that time my cough was no better than when I first went there. My worst spell of coughing begins about four o’clock every morning, and continues usually, without little stop, until seven. I have never had the slightest pain; my appetite is good, going up stairs makes me short-breathed, and causes a feeling of suffocation. I sleep well when not disturbed by cough.” Examining his lungs, I discovered on the left side the faintest sibilant râle, heard only occasionally. At the base of the same lung, behind, I also discovered congestion in several lobules, from which I inferred that he was on the eve of an intercurrent pneumonia, requiring nothing but fatigue or exposure to bring on the first stage of engorgement. I also found, with the first and second sounds of the heart, murmurs which had a shriller sound than usual.

Ordered for him salicylate of sodium, $\mathfrak{Z}\text{ij}$; aqua destillata, $\mathfrak{Z}\text{vj}$ —a tablespoonful every six hours; and to keep in a temperature of from 68° to 72° F. until his cough was better. Four days later, having taken the potions ordered, he came to see me again. The cough had entirely ceased, but he was suffering with pain in the right shoulder running towards the scapula and dorsal vertebra. Ordered him to get the vial refilled, and having, four more days elapsing, taken contents, he came and said that he had had no return of cough, but that the pain in the shoulders still continued, and extending gave him a crick in the neck, on both sides of which there was also pain and soreness; the murmurs with the heart-sounds had entirely disappeared. Seeing that his complexion had a jaundiced hue, and that his tongue was coated, I gave him the following: R. Benzoate sodium, $\mathfrak{Z}\text{iss}$; extract of taraxacum, $\mathfrak{Z}\text{j}$; aqua cinnamom. $\mathfrak{Z}\text{ij}$. S. A tablespoonful every eight hours. Having taken this, he came here two days later to say the pain was gone, and that he felt perfectly well.

The mortality from this disease during a single week is exhibited in the following, clipped from a current medical journal:—¹

The Registrar-General, in his last weekly return, calls attention to the fact that the combined effect of dense fog and low temperature has once more raised the metropolitan death-rate to a point which is seldom reached except during the prevalence of severe epidemics. Since the cholera epidemics of 1849, 1854, and 1866, the London death-rate has been raised to an abnormal point on three occa-

¹ British Medical Journal for February 13th, 1882.

sions, on each of which the excessive mortality has been due to fog and low temperature. In the week ending December 20th, 1873, following the memorable fog which was so fatal to the beasts at the Islington Cattle Show, the metropolitan death-rate rose to 37.5; in the week ending February 7th, 1880, following a week of intense frost and dense fog, the rate rose to 46.7; and again last week, influenced by the dense fog of the previous week, and a few days of low temperature, the exceptional death-rate of 35.3 was recorded. An analysis of the age-distribution of the deaths last week shows that the excess of mortality due to fog and cold affects the London population at each group of ages; this noxious effect is, however, smallest among infants under one year of age, while it is most strongly marked among elderly persons. As regards disease, the most fatal effect of the fog is shown in the deaths referred to diseases of the respiratory organs, which from 415, 543, and 647, in the three preceding weeks, further rose last week to 994; this latter number—of which 696 were attributed to bronchitis and 185 to pneumonia—exceeded the corrected monthly average by no less than 427. The peculiarly fatal character of the London fog may be inferred from the fact that, during last week, while the Metropolitan death-rate rose from 26.4 and 27.1 in the two previous weeks to 35.3, the rate in the twenty-seven provincial towns, having an aggregate population exceeding that of London, only rose from 23.4 and 23.1 to 25.2. Thus the London death-rate last week exceeded the average rate in the twenty-seven provincial towns by no less than 10.1 per 1000; and as the mean temperature in the provincial towns scarcely differed from that in the metropolis, this excess death-rate of 10.1 per 1000 may be attributed to the pernicious effect of the London fog.

The certainty is that these 696 fatal cases attributed to bronchitis were destructive because of rheumatism seated in the white fibrous tissue of the bronchi. If otherwise, why did they die, since bronchial catarrh is not a mortal disease? And of the 185 deaths reported as having happened from pneumonia, it is largely probable that very few of them were typical and idiopathic, but were rather symptomatic engorgements, sympathetic with and engrafted on pre-existing fibro-bronchitis of a rheumatic character, and that the only hope lay in treating them for rheumatism. What possible good could have been accomplished by prescribing for these 881 cases anodyne, expectorant, and antiphlogistic cough mixtures, when they all should have been regarded and treated as having at base a rheumatic principle which had to be dislodged and dissipated before these cases could possibly have recovered?

It is certainly not very promising for either vital or mortuary statistics that 881 cases of rheumatism should, in a single week, have been treated for bronchitis, the definition of which is "inflammation of the mucous membrane of the bronchi," nor credible to medical science that such wholesale errors of diagnosis should ever have happened, especially in one of the great emporiums of medical learning. Nevertheless, we are gratified to have the mortuary record, but would have been much better pleased had the disease rheumatism, whereof the 881 patients died, been stated.

Regarding the etiology of fibro-bronchitis, and knowing that exposure to cold, wet, and dampness are the producing causes of rheumatism, it may be well to remember that there is nothing so apt to cause rheumatic inflammation of the white fibrous tissues of the bronchi as breathing for some time an atmosphere highly charged with watery vapour at or below

the temperature of ice. The strongest possible percussion from cold is that of taking into the lungs at each inspiration air loaded with frigid vapour, in corroboration of which the extremely interesting and instructive record of the London fog endemic furnishes the strongest possible evidence. To the 696 fatal cases attributed to bronchitis may safely be added the 185 deaths from pneumonia, for the very strong probability is that most of the latter were symptomatic engorgements supervening on pre-existing fibro-bronchitis, except where rapidly advancing hyperæmia also invited by rheumatic bronchitis caused sudden death, as I have seen happen in three notable instances.

And if the whole 881 cases had been treated neither as bronchial catarrhs nor as pneumonias, but for rheumatisms in the white fibrous tissue of the air-tubes, the chances are that the very large majority of both diseases would have ended in recovery, since it must be remembered that during this fog endemic there were thousands of cases of bronchial catarrh which, being a benign disease, yielded readily to cough mixtures; but 881 fatal cases being quite a different affection were of necessity mortal, because they were not recognized and treated as a rheumatism of the bronchi with or without supervening engorgement and attended in many cases by endo-pericarditis.

The reader may naturally ask what should have been the agents used for the relief of the foregoing cases, and what signs point to the employment of one in preference to the others in the different forms of rheumatism? If a patient has rheumatism in the fibrous tissues of the body, and more especially where it is visceral and latent, use the signs furnished by the urine. Get a sample of the urine, and, in the absence of a test-tube, fill with it a wineglass two-thirds full, hold the glass up to transmitted light, and add to the contained urine two or three teaspoonfuls of aqua ammonia. If, on adding the ammonia, the urine becomes cloudy, you may know that triple phosphates are present in excess, that the rheumatism is phosphatic, and that lemon-juice is the remedy not only for that state of the urine, but for rheumatism depending on their presence in the blood. But if, on the contrary, the urine becomes clear and more translucent than it was before the ammonia was added, then you may know that the urine and the blood as well contain uric acid or urate of soda in excess, and that the appropriate remedies for this form of rheumatism are salicylate of sodium and phosphate of ammonia; the former being, as a rule, best at the beginning of an attack of rheumatism, while the latter, as a special solvent for urate of soda, will often be found more useful at its close.

Aqua ammonia is a far better extemporary test than litmus paper, which latter constantly shows acid reaction when the urine is loaded with phosphates; moreover, aqua ammonia is always at hand, and is to be found in every dwelling under the name of fluid sal volatile or hartshorn,

so that there is no loss of the time which would be required to have the urine analyzed, pending which the patient may die, especially if threatened with supervening hyperæmia of one or both lungs.

When, on adding the ammonia, the urine becomes *translucent* for an *instant*, and a moment after *cloudy*, it is a sign that all the salts are in excess, and that while salicylate of sodium is needed to dissolve the urates, lemon-juice is also required to get rid of the phosphates.

Aided by the ammonia test, I have repeatedly treated fibro-bronchitis and rheumatic pneumonia according to the indications furnished by the urine. When the triple phosphates were in excess, I have treated successfully a number of cases with fresh lemon-juice alone; when uric acid and urate of soda were present I treated them with like success by the use of phosphate of ammonia only; and when the urine furnished no particular guide, I have found salicylate of sodium all that could be desired. In fact this agent seems to take the place of all the other remedies provided when the triple phosphates are in excess; its affinities for the nitrogenous morbid salts are allowed to have their play by giving the acid of two lemons daily as solvents of said phosphatic salts.

It may also be asked, how is the general practitioner to know when rheumatism of the bronchi exists? I would say that here he is more even with the pulmonary specialist than in any other disease of the chest with which we are acquainted, since the evidence furnished by exploring the chest is in the case of fibro-bronchitis entirely negative. Therefore the auscultator and general practitioner stand in this case on common ground, since each would have to draw the differential diagnosis between bronchial catarrh and fibro-bronchitis from the fact that in the former there is always more or less mucous sputa, whereas in the latter the cough is uniformly dry, loud, unproductive, sometimes continued, but very generally paroxysmal. If you have a patient with this character of cough, examine the palate, and if there is no elongation of the uvula, the case may be set down as one of rheumatic bronchitis. But when, in rare cases, rheumatism is seated in the right or left primary bronchus, which is more fixed and immovable in breathing than the rest of the air-tubes, there is often little or no cough, and then the attendant has to wait for signs in the supervention of carditis or pneumonia, which latter is not to be treated for engorgement, but for the rheumatic bronchitis which gave rise to it, on the principle, remove the cause and the effect ceases.

In the acute variety attended by fever, there is besides a continued or paroxysmal and unproductive cough, inordinate sensibility to cold, profuse irregular sweats, and transient flushings of the face. The rigaphobia is often so great that the patient dreads having a finger get from underneath the bedclothes.

In attending too exclusively to local signs, the great value and significance of general symptoms have been too much neglected. Every one

recognizes the diagnostic value of cough in pertussis and croup, and in most other chest affections; cough has as much meaning as the notes on a gamut, the barking of dogs, or the bleating of sheep. Who has not noticed the character of cough in asthma, pleurisy, laryngitis, pneumonia, its metallic sound in crude tuberculous deposit, etc.? Therefore, when an individual has, in the absence of an elongated uvula, a harsh, husky, dry, boisterous, and often paroxysmal cough, lasting for days, it may be looked on as absolute evidence of fibrous or rheumatic inflammation of the air-tubes; and the case should at once be treated for true rheumatism, and not, as is generally done, for bronchial catarrh, which recovers in ten days whether much or nothing is done for it, while dry catarrh (a contradictory term), our ignorance of which Laennec deplored, is one of the most obstinate and intractable of all the acute diseases.

It is to be hoped that the etiology and pathological semeiology of fibro-bronchitis and rheumatic pneumonia have been rendered sufficiently clear, and that they will not only be recognized and treated for rheumatism, but regarded henceforth as nosographic entities.

I recall a letter written to me fifteen years ago by Dr. Alfred Stillé, wherein he said he had had a case of rheumatism, which, commencing in the left tonsil, was afterwards transferred to the heart and lungs. This distinguished lecturer and teacher, having accepted fibro-bronchitis as a novel and distinct entity, I shall be glad, after nearly thirty years have gone by, to have his indorsement of the culminating points growing out of views with which he is already perfectly conversant.

Having said all that is at present deemed desirable on the subject of visceral rheumatism as it affects the lungs, I refer the reader for the treatment of ordinary idiopathic pneumonia as it generally occurs in every country, to an article which I published in the number of *The Medical News* for June 17, 1882.

2 RUE DE PRESBOURG, PARIS,
April 15, 1882.

ARTICLE III.

THE RELATIONS AND PATHOLOGY OF THE PACCHIONIAN FORMATIONS, AND THE SPACES BESIDE THE SINUSES OF THE DURA MATER. By W. BROWNING, M.D., Resident Physician at the German Hospital, New York.

THE nature of the granulations of Pacchioni has long been an unsettled matter. Formerly they were called glands, but of late this term has been given up, especially since it has been shown that their finer structure is in no sense glandular.

According to Pozzi (*Diet. Encycl. de Sci. Méd.*, t. 22, p. ii. p. 419),

these structures were first mentioned by Méry, 1701 (*Hist. d. l'Acad. roy. d. Sci.*, 1701). This would remind one of the naming of America. But the same writer further shows that Pacchioni doubtlessly made his discovery quite independently, and, moreover, described the formations much better than Méry. Within the next five years they seem to have corresponded several times as to the nature of the said structures. Their ideas in this respect were, of course, clouded by the absurd fancies of that time. Hyrtl refers to a Pacchioni, *Diss. Phys. Anat. de dura Meninge*, Romæ, 1721; Henle to Pacchioni, *Opera*, Rom. 1740.

The Pacchionian granulations are small nodular growths of the (cerebral) arachnoidea. They are usually more or less clustered, and the larger ones are as a rule pedunculated. Luschka (Virchow's *Arch.*, vol. 18) claims, it is true, that they can originate from the inner surface of the dura mater, but Ludwig Meyer (Virchow's *Arch.*, vol. 29, pp. 171 and 288) brings a row of observations to the effect that, if the dura be removed with proper care, it is always possible to see the pedicles by which the granulations which have grown into the dura still connected with the arachnoidea. They can originate as well from the arachnoidea where it bridges the sulci as where it lies on the crest of the gyri (Foerster, *Path. Anat.*). The conclusion of Meyer, that the granulations originate wholly from the cerebral arachnoidea, is surely correct. He also states that in the normal condition they are covered by an epithelial layer like the arachnoidea itself.

On the authority of Key and Retzius (*Nordiskt. Med. Ark.*, 1870, Nos. 6 and 9, and 1871, No. 26; see *Medical Annals* for that year), it is stated that these granulations fill to little vesicles on injecting the sub-arachnoidal space. A remark of Meyer (*loc. cit.*) tends to confirm this. "The collective villi are very often infiltrated with serum when there is marked œdema. They can be easily reduced by pressure or incision, like œdema of the arachnoid itself. These facts speak for the granulations being pouches of the arachnoidea."

Key and Retzius in their large work (*Studien in d. Anat. des Nervensystems*, etc., Stockholm, 1875-76) state further that the cerebro-spinal fluid makes its way from the subarachnoidal space through the Pacchionian granulations into the venous spaces of the dura, and by ways as yet unknown into the lymph vessels of the head, especially those of the nasal mucous membrane. Although outside of the present subject it is worth noting that other writers refer to "perinervous lymph passages between the subarachnoidal lymph spaces at the base of the brain and those of the nasal mucous membrane." Finally, Kollmann (*Corresp. blt. f. Schweizer Aerzte.*, 1880, No. 18) has fully confirmed the conclusions of Key and Retzius regarding these granulations.

It has long been noticed that the Pacchionian granulations are limited in their occurrence to certain parts of the arachnoidea, in greatest fre-

quency, it is true, along the sides of the longitudinal sinus, but, as especially emphasized by Meyer, also occurring in the middle or temporal fossa, over the anterior lobes, often 3, and not rarely 4–5 cm. from the mesial line, along the transverse sinuses, over the vermis superior of the cerebellum, and even at the posterior end of the occipital lobes. In cases of adhesions and the like, it is probable that they may occur on all parts of the arachnoidea, as in the case given by Nauwerck (*Deutsch Arch. f. klin. Med.*, July 15, 1881, p. 65). The subject of this observation had had a severe fracture of one of the parietal bones many years before. Opposite this part abundant adhesions and Pacchionian granulations were found. It is, however, very striking that they are so generally found in the vicinity of a sinus.¹

Trolard (*Arch. gén. d. Med.*, 1870, p. 258) is accredited with having first called attention to the cavernous nature of these growths and their connections with the neighbouring venous vessels. He was, however, hardly earlier than the Swedish anatomists, Key and Retzius. The latter observers mention especially the connections of these spaces with the small veins of the dura, and with the sinus.

My own injections have shown that a large share of the granulations which penetrate the dura do present this venous nature, but that not all even of these do. The real meaning of this will be given further on. On the other hand, such granulations as have not penetrated or become attached to the dura contain neither veins nor venous cavities. The statements of the above-mentioned observers are, therefore, true only to a certain extent.

We will now turn to another structure which has also gained recognition within a few years. Trolard, in the above-mentioned article, tells of spaces along the sides of the sinus longitudinalis. These have been more fully described by Langer (*Blutgefäße d. Knochen d. Schädels u. d. harten Hirnhaut*, Vienna, 1877), who gives an accompanying illustration taken from a corrosion preparation. He also mentions their limited occurrence beneath the sinus in the falx cerebri. I have had occasion elsewhere² to detail their occurrence along both sides of the sinus longitudinalis, and both sides of the sinus rectus (sin. quartus). Their largest size is at about the crown of the head or opposite the middle of the long sinus. These spaces are very irregular in form and outline; they are injectible from (or with) the sinus, and certainly communicate with the veins of the dura and occasionally with an Emissaria santorini. Many of the dura

¹ Pacchionian granulations have been said to occur in animals in the same way as in man (Foerster). Even the venous spaces of the dura present granulations according to Henle. Most English and American writers, however, claim that they do not occur in animals. In several sheep, calf, and rabbit brains, nearly all, it is true, from young animals, and examined more for another purpose, it was not my fortune to find any.

² To appear in Braune's (Leipsic) Atlas of the veins of the human body.

veins may in fact be said to empty into these parasinoidal spaces.¹ On the contrary, the superior cerebral veins do not seem inclined to empty into them, but run along or through them to the sinus. The spaces belong therefore not to the pia or cerebral system of veins, but to the dura veins. The positive results of natural injections, whenever they can be found, are far more trustworthy than those of artificial injections. The following case is decisive in this connection, besides giving some points of interest further on.

Male, aged 42 years. Lympho-sarcoma of the neck, obliterating the right jugular vein. Tumour began three months before. Death fourteen hours after operation. The longitudinal sinus turned, as in the majority of cases, into the right transverse sinus. Pale clot in the long sinus, and some dark blood in the posterior part of it. The coagula extended into the pia veins, into the parasinoidal spaces, and from these into the fine dura veins. On catching up the clots in the spaces, those in the dura veins could be drawn out as long dependent shreds. Pacchionian granulations in the spaces; and on the arachnoidea very marked opposite the large veins.

There is in several respects a great similarity between these parasinoidal spaces, and the sinus cavernosi. Henle (on authority of Cruveilhier and Virchow) says that it "is not rare to find in senile subjects the dural venous spaces—over the clivus connecting with the sinus cavernosi, sinus petrosi inf., and anterior spinal plexus—developed into wide cavities which are crossed by reddish trabeculæ similar to the sinus cavernosi." My own injections carry out the analogy that the parasinoidal spaces increase in size as life advances.

Meyer (*l. c.*) claims that the sinuses of the dura mater can yield somewhat to cerebral pressure, and thus act as a regulator as well as the cerebro-spinal fluid. He includes the larger veins as possibly accessory in their action.

François Franck (*Gaz. hebdomadaire*, July 8, 1881) goes further, and excludes wholly the participation of the cerebro-spinal fluid in this action.

The parasinoidal spaces must be important accessories to the veins and sinuses in this respect. They can dilate considerably, and should not be forgotten in considering this question.

After this preliminary explanation, it is evident that the old definitions and classifications are insufficient, and that we can distinguish—

1. Parasinoidal venous spaces.
2. Granulations (so-called Pacchionian) of the arachnoidea.
3. Combinations of these two.
4. Depressions on the inner plate of the skull (foveæ glandulares of Meckel).

1. The spaces have been described.
2. The granulations in the sense here used refer to the pale villous growths of the arachnoidea (arachnoidal villi of Luschka). For all of these,

¹ Some special designation for the spaces is necessary; perhaps the one here used will suffice.

whether structurally quite identical or not, the term granulation applies well. They do not always, though usually when of much size, become adherent to the dura directly covering them; in any case they press against the dura.

3. If now one of the venous spaces lies in the way, and where the most abundant granulations occur this is the case, it is evident that a sort of double structure will result. The venous space will be more or less filled, and the corrosion casts of them have then a correspondingly broken and irregular appearance. That the nature of the granulations is to grow towards and into the venous spaces explains why they have been classed as venous cavities; certainly the simple granulations are not such, but only the compound form. The granulations can also become adherent to and penetrate the dura at the points where there are no spaces. Here they will present venous characteristics only in so far as the dura at that point contains veins.

4. It seems to be the granulations penetrating the dura at points where there are no venous spaces that cause the depressions on the internal surface of the cranium. These foveæ glandulares are without doubt produced, as usually supposed, by the growths pressing against the bone. A good analogy is the thinning and perforation of the skull in the rare cases of aneurism of the meningeal arteries. As a rule, the granulations destroy the inner plate, but occasionally they repel the bone so as to cause a slight elevation externally. Pozzi claims this to be occasionally the fact, and the cases of Immerman (*vide* Obernier in *v. Ziemssen*, vol. ii. p. 236, Leip. 1876) and of Virchow (*Geschwülst*, 1865, i. p. 31, foot-note) prove it to be true. The latter says it is not at all rare to find flat elevations along the median line of the skull, caused by the growing Pacchionian granulations, and that these elevations, in their external character, present the greatest resemblance to the common forms of flat cranial exostosis. Pozzi says that the foveæ may reach a diameter of 20 mm. It is evident that in some descriptions the simple granulations, in others the compound form (for which the term Pacchionian bodies might perhaps be retained), and in still others the foveæ glandulares, are referred to. In many cases it is impossible to tell which, and such observations lose correspondingly in value.

On turning once more to the pathological side of these growths, we find several points of interest. Their marked prevalence opposite venous spaces leads to their penetrating them, and even growing into the venous sinuses. Henle (*Anat.*) even says that wherever these granulations occur in the cranial cavity, they push into veins, sinuses, or other venous spaces. It is, however, despite this statement, very rare that they penetrate veins. I have never been able to find a marked case of it, and only once in a vein passing through a venous space beside the long sinus, a single small sessile villus projecting into the interior of the vein. Hyrtl states that

from the walls and trabeculæ of the sinus cavernosi tuft-like vegetations project a couple of centimetres into the cavity of the sinus. Nearly all writers on the subject mention that the granulations now and then grow into the sinuses. One would certainly expect, if such were the case, that they would occasionally cause sinus-thrombosis, and Foerster asserts that this may happen. One frequently finds cases where the granulations seem to protrude into the sinus, but it is questionable whether this is in reality often the case. The most marked example of this which I have met with was in a male subject, aged 49 years, who had died of cancer of the liver. The granulations appeared to have perforated the sinus wall, and to be projecting freely into the sinus. On closer inspection, however, it proved that the sinus walls had not been perforated, but that the openings were simply those normally connecting with the veins, and parasinoidal spaces. And, secondly, it was doubtful whether the granulation-tufts had *in situ* projected at all into the sinus. On freeing the dura from the bone, the sinus collapses more or less, and the granulations may then present the appearance alluded to. Therefore, although they occasionally project into a sinus, it is more correct to say that these granulations do not tend toward the smooth-walled sinuses, but to the irregular venous spaces to which, structurally, the sinus cavernosi belong.

Meyer's statement that, in cases of chronic meningeal irritation, the granulations penetrating the bone may themselves ossify, I can confirm. Instead of a depression in the bone, one then finds a slight elevation, and, as I have seen, likewise spicules of bone in the meninges.

A variety of morbid conditions are known to favour their unusual development. One of these causes is chronic alcoholism. According to Hyrtl, they are found of specially large size in men who have suffered from habitual headache, and in drinkers who have died of delirium tremens. In cases of brain tumour—glioma, sarcoma, gummata of dura (case of Lancereaux), carcinoma, etc.—one often finds an excessive development of the Pacchionian granulations noted. Atrophy of the brain, with inflammatory affections of the pia and arachnoidea (Hasse, 1855), may also act as a cause. In subjects who have suffered from a variety of mental and brain troubles, it is very common to find them strongly developed. Fröhlich (*Wiener Klinik*, March, 1881, pp. 54 and 56) emphasizes their marked increase in some fatal cases of cerebro-spinal meningitis at the Leipsic military barracks; the subjects' ages would, therefore, range from eighteen to about twenty-five years. The sinuses of the dura were also found overcharged with blood. In the three cases which he specially notes, the disease had lasted respectively one, six, and six and two-third days. This is not quite such an exceptional find as it at first seems. Archambault (*Dict. Encycl. de Sci. Méd.*, Paris, 1873, art. Meninges, p. 552) remarks that they have often been noted in children in cases of meningitis, and that the name aciniform has been proposed for this granular meningitis.

Again, Meyer (*l. c.*, note to p. 309) relates that in two children, each under two years of age, a large development of Pacchionian granulations was found. One of these children had suffered from rachitis and light hydrocephalus, the other presented an extensive tubercular meningitis.

These granulations, consequent upon meningitis, seem to argue for a form of inflammatory origin, and it is possible that they are in reality somewhat different from the usual Pacchionian growths. Still the observations of Fröhlich are unique, considering the age of the subjects and the duration of the trouble. They could certainly not have indented the bone or penetrated much into the dura in that short time, and could, therefore, have been at most but simply granulations. It also follows, from the above cases, provided they were real Pacchionian growths, that the old idea of the granulations not occurring in childhood, or, as has been asserted, not before the tenth year, is erroneous. It is easy to find in the literature a large number of cases where a marked development of the granulations was found between the ages of twenty and thirty years. Nevertheless, while they are rare in young subjects, they are constant in old ones, so that age is likewise an important factor in their development.

A few decades back these formations were considered, for the most part, of inflammatory origin. More recently they were believed to be largely a product of hyperæmia, and we will presume that inflammation was then figured as one of the causes of hyperæmia. Finally, Meyer (*l. c.*) has suggested a mechanical cause, but neither his facts nor reasoning support his theory well. He gives a diagram, according to which the highest point of the cerebrum, the apex of the occipital lobe, and the apex of the temporal, as well as the base of the frontal lobe, are more exposed to pressure, and to back and forth movement than other parts. This, however, does not agree well with the actual occurrence of the granulations, and need not be further discussed here than to say that his own conclusions, in other parts of his article, agree with the explanation here to be proposed. There is a mass of evidence indeed in support of hyperæmia as their cause, and yet there are some things which do not harmonize therewith. It is possible that different writers may not have the same thing in mind in speaking of hyperæmia in this connection. In order to have something tangible, we assume it is meant that the excess of blood, or possibly stasis in cerebral hyperæmia, exerts in some way a specific influence (chemical leading to hypertrophy?) which tends to produce these growths.

The considerations opposing such a view may be summed up as follows:—

1. Is one to understand active (arterial) or passive (venous) congestion? If some specific action of an excess of blood is meant, it is hardly probable that the two would act in the same way.

2. If hyperæmia simply be the direct cause, it is difficult to understand

why the granulations have so marked a predilection for certain limited tracts of the arachnoidea, and are not equally distributed on all parts of the convexity. The large veins near the sinus take up no new branches, therefore, any special action of venous blood should be most marked at some distance from the sinuses, instead of in their immediate neighbourhood, as is the case. Arterial hyperæmia alone is still less tenable.

3. Cases of hyperæmia, where no unusual development of the growths was found. Although this has been claimed, it is somewhat doubtful, for, if we demand that only venous hyperæmia be included, the anomalous cases reduce, and there are very few facts to warrant the assumption, that arterial hyperæmia, as such, is a cause. Severe forms of chronic venous stasis, on the contrary, lead almost invariably to development of these growths. A rather unique case illustrating this is given by Lamb (Kinderspital, Prague, 1860, p. 134):—

Girl of twelve years. The autopsy showed anasarca, hypertrophy of the whole heart and dilation of its cavities. Foramen ovale still open, and a communication between the right auricle and the right pulmonary vein. This congenital defect had caused general venous stasis of a high degree during life. *Along the falx-cerebri an abundance of Pacchionian granulations.* Brain substance rather hard, and presenting numerous blood-points on section.

The formation of the granulations at this early age must surely be attributed to the disturbance in the venous circulation. But if the trouble has been of short duration, this does not necessarily follow, as illustrated by the case given above of impermeable right jugular leading to thrombosis in the sinus and veins without, however, any extra development of the granulations.

4. Cases in which the granulations were found excessively developed, and yet where there had been no hyperæmia to cause them. As long ago as Foerster (*l. c.*) this was noticed. A close sifting of all such cases, however, greatly reduces the number where hyperæmia can be positively excluded. In the many cases of brain tumours which lead to high degrees of cerebral anæmia, and in which, nevertheless, large granulations present themselves, it is not easy to exclude the possibility even of venous hyperæmia in the earlier stages. Still there remain some cases where any corresponding degree of hyperæmia is improbable.

It is perhaps worth while to give a possible explanation of the origin of these granulations. Since coming to the conclusions in the following explanation, the article, and in some respects similar theory, of Meyer have come to my notice. He calls attention, however, as above stated, to many facts which his proposed theory does not explain, but which are quite in accordance with that here presented.

Some irritation of the parts from which the granulations spring, more than of the remaining arachnoidea evidently occurs, and the facts speak for this having a mechanical cause dependent in some way upon the ebb and flow of the blood in the venous vessels just before the sinuses.

In this case not the hyperæmia or venous blood, as such, is the cause, but the blood acting as any other fluid of the same consistency would do. I have made an observation as to the location of these granulations, which speaks almost conclusively for the view which it is desired here to present. In those brains where the relations have not become obscured, it can often be seen that the granulations grow up from the arachnoidea directly beneath the large veins as they near the sinus. One case illustrating this has been given above.

As long as the veins remain within the pia, no granulations are seen, but as soon as the veins get outside the arachnoid, either between this and dura, or in the dura, the granulations begin, some already adherent to the vein covering them, others not. In the space between one large superior vein and the next, few granulations will appear; but when a large vein crosses they may be traced beneath it for some distance from the sinus. In a majority of cases this is not easy to recognize, partly from adhesions, partly from granulations of a similar origin soon to be noted; but, when one does find a case where this is well marked, it is convincing that the mechanical action of the vein must be the cause.

It is evident that the veins beneath the arachnoid may exert pressure, but no displacement, no back and forth motion, as is the case when, on nearing the sinus, they become external to the arachnoid.

Horner (*Anat. and Histol.*, Philadelphia, 1851) doubtless refers to the same thing, when he mentions the "chain-like arrangement of the granulations along the superior cerebral veins, as they approach the sinus." An observation of Meyer's (*l. c.*) also agrees with this. He mentions "some little foveculæ along a sulcus running backward to the base of the os petrosum," certainly the sulcus of the vena cerebri media, which often empties, as described by Trolard (*l. c.*), into the sinus petrosus superior, after running posteriorly in the dura under the temporal lobe. Again, Meyer says: "At the base of the temporal lobe the Pacchionian granulations occur in all degrees of development, as a rule, corresponding to the arrangement of the art. and vena mening. med. Sometimes they press here into the interior of the vein, as in other places into the sinuses. This allows the influence of the meningeal vessels upon the villi to be clearly seen." At this point Meyer almost states the theory which we have put forward, yet he seems to have forgotten it when he comes to propose a general explanation.

The parasinoidal spaces would in this way have their share in the production of the granulations. Their filling and collapsing would act quite similarly to the same process in the veins. This also explains why the growths are found along the sides of the sinuses, even at points where there are no veins. It is noticeable that their greatest size and frequency correspond to the most abundant granulations. To the possible objection that the latter are so often found over the frontal lobe, it may be

answered, first, that this portion of the brain is acknowledged to have a greater tendency to hyperæmia. Sudden changes in the venous circulation affect this part more directly, since the superior veins here have a freer discharge into the sinus than those more posterior; secondly, as I have found, the superior cerebral veins in this part often spring over from the pia to the dura, at a considerable distance from the sinus. Langer (*loc. cit.*), speaking of the superior veins collectively, says he has seen cases where they do this two inches from the sinus. It should be added that this is not at all rare in the anterior ones, and attention may well be called here to a relation of these parts, which seems to have been overlooked. It is known that the anterior superior veins run pretty straight to the sinus, while those more posterior run forward a distance beside the sinus before emptying into it. If now the veins be followed in their course from the convexity to the sinus, it will be found that most of the anterior ones spring over from the pia to the dura at from 1-3-4 cm. away from the sinus. On the other hand, the further we go back the more we find that the veins continue in the pia until they are beside the sinus, and that the most posterior ones bend and run forward 1-2 cm. before they leave the pia, but that these same veins, between their point of springing over and their ending in the sinus, traverse the dura a distance quite equal to that done by the anterior veins. The only difference then is that in one case this distance is measured straight away from the sinus; in the other, it has swung round to the side of the latter. This is but a rule to which there are frequently exceptions. Pozzi (*loc. cit.*) states that the depressions (foveæ) occurring along the superior longitudinal fissure are each at the extremity of a branch of the meningeal artery. This is true for some, but not for all. He also claims that the foveæ are inclined to occur symmetrically on both sides of the sinus. When but one is present, however, this, he says, is oftener on the left side. In many cases a certain symmetry is indeed noticeable, although this is not very regular. Possibly this may depend upon the fact that the superior cerebral veins occur in pairs (*Braune's Atlas, Veins of Brain*).

This explanation gives us also an insight into the increase of the granulations with age. To quote Huguenin (*loc. cit.* p. 398): "In the senile brain, on account of diminution in volume of nervous elements, the variations in the width of the vessels can be larger than in middle life." The same holds true of the parasinoidal spaces, as already indicated.

From all this it is evident that while hyperæmia must be a frequent cause, still the same results could be produced in other ways, though perhaps more slowly; especially rapid changes in blood pressure in the vessels without at any time reaching decided venous hyperæmia; in fact, any changes or disturbances of the local circulation, possibly even a change of consistency of the blood, or the filling and pressing of the falx and venous spaces by tumours. The largest meningeal arteries with their

pulsation are consequently more active in this respect than veins of the same size.

It would be interesting to inquire what clinical symptoms can be traced to these granulations; but facts bearing on this question are almost wholly wanting. Four points only can we refer to: 1. A few cases are recorded where large Pacchionian-like granulations pressing on the ganglion Gasserii, or on one of the motor nerves of the eye in the same vicinity, have been the only discoverable cause of corresponding neuralgic or parietic symptoms during life. Meyer (*loc. cit.* p. 305) seems to attribute various neuralgic attacks in the region of the first branch of each fifth nerve, in one of his cases, to large granulations pressing on each ganglion Gasserii. Some other cases have been reported where granulations (kind not mentioned) were found in the above-named locality, pressing on, or surrounding the affected nerves. 2. It is a question whether these growths penetrating the dura produce headache. Most causes leading to their development of themselves tend to produce headache. If, in rare cases, a localized pain, complained of by the patient, has been found later to correspond approximately with large Pacchionian granulations, it is still far from conclusive. 3. The possibility of the granulations growing into a sinus so as to cause a thrombus has been alluded to above. There would then, of course, be the symptoms of sinus-thrombosis. 4. The little flat elevation of bone along the median line at the crown of the head. These are sometimes caused, as described above, by the Pacchionian granulations pressing against the bone from the inside.

Finally, a few words as to the part the parasinoidal spaces play in pathology. A variety of facts demands that we look to these spaces as the place where many a sinus thrombosis originates. It is known that sinus thrombosis may form by continuation from the afferent pia veins. It is also known that in the veins in other parts of the body spontaneous thrombosis very generally begins behind a vein-valve. To this the necessarily sluggish circulation within the parasinoidal spaces closely corresponds. That a thrombus can form in these spaces is proved by the case of my own observation cited above.

Huguenin (*loc. cit.* 1876), referring to the recently proved venous character of the Pacchionian granulations, says: "The frequently well marked venous gorging of these vessels is known, yet we have never been able to discover a division of continuity, although several times old thrombus in the veins." Again, he speaks of an overfilling of the veins of these granulations in atrophy of the brain, and in pachymeningitis hemorrhagica interna. This venous filling in atrophy of the brain, we can see, is readily accounted for by the dilation of the parasinoidal spaces to make up for the shrinking brain (*ex vacuo*). In still another place he says: "Somewhat frequently, although in general rarely enough, the blood from the sinus passes through the injured vascular wall into the lumen of the

villi, which have grown into the dura. I once saw, says he, the wide spaces, which the growing Pacchionian granulations had formed in the dura beside the sinus, filled with black grumous blood." He, of course, refers to the parasinoidal spaces, and the penetration of the villi by the blood reminds one of the conclusion of Key and Retzius, that the cerebro-spinal fluid passes in the other direction through the villi into the venous spaces. Meyer (*loc. cit.* 1860) had made similar observations. "In some cases," he says, "I have seen the venous vessels, in the areolar meshes at the side of the sinus longitudinalis, greatly dilated. They, as blood-charged sacks, filled up numerous wide lacunæ in that part. The rather largely developed Pacchionian granulations had not penetrated the areolar tissue at these points, but remained on the arachnoidea on removing the dura mater."

If we review the cases where a thrombus filled but a part of the long sinus, a majority are found opposite the largest parasinoidal spaces. The largest veins empty, it is true, at this point, but if the thrombus extended into them it is generally noted. The preponderance in this part can, therefore, be best explained by considering that the thrombus first formed in the spaces and then continued into the sinus. Where, therefore, no special or local cause for the thrombus can be found, the spaces should be held as the probable primary seat.

These spaces are again the chief dépôt or half-way house of many septic processes progressing from outward (cranium, dura, etc.) towards the sinus and brain. The anatomical relations demonstrate the necessity of this, since the veins of the diploë and dura, the chief recognized path by which such processes make their way inwards, nearly all communicate with or empty into these spaces. These, in turn, communicate with the sinus. It has even been mentioned in some cases of so-called sinus-phlebitis that collections of pus were found in the dura beside the sinus.

The descriptions of so-called varix of the sinus longitudinalis accord much better with the supposition that they develop from or are appendages of the parasinoidal spaces, and are, therefore, not true varices of the sinus. Meschéde (*Virch. Arch.*, vol. 57) claims to describe a true varix of this part. The patient had suffered from epileptic fits for thirty years. The supposed varix was the size of a bean, and had reduced the bone over it to paper thinness. It contained coagulated blood, and *communicated by a somewhat irregular connection with the sinus*. But even in this case the cavity seems to belong to the spaces and not to the sinus. This whole question of sinus-varices hangs very closely together with that of the so-called subpericranial sinuses or blood-tumours external to the cranium, yet connecting with a sinus of the dura. These only interest us here with regard to a possible cause.

Legouest and Servier (*Dict. Encycl. d. Sc. Méd.*, art. *Crane*, 1879) have advanced a plausible explanation of their origin. Some cases of this

trouble are known to have been congenital, others were caused by trauma. The above writers call attention to the venous nature of the Pacchionian granulations (bodies), and to their thinning the cranium over them. In cases where they perforate the bone, it is imagined that such a subpericranial venous tumour might result. This theory might be perfected by remembering that, when the bone had become much thinned at any point by granulations, a slight blow would suffice to finish the perforation. But, as shown above, the granulations presenting the most venous characteristics do not, as a rule, penetrate much into the bone. Although it is often stated that the granulations occasionally perforate the bone overlying them, it is difficult to find actual cases in the literature. Pozzi quotes from Weber Ribes (*Bull. d. la Faculté d. Méd.*, Paris, 1819, p. 303) a case of such perforation, where the hole of the opening was small and surrounded by smooth bone. A ligamentous covering completely closed the opening. There are, however, many cases recorded where the bone had been reduced to paper thinness.

That these growths do not oftener perforate the cranium is due perhaps to several causes. Whatever occasions their development has doubtless ceased to act before they get that far. Again, at this very point, where their force slackens, they meet the hard external plate, and are able to go no farther.

The new data used in this article were collected either at the Anatomical Institute, Leipsic, or at the German Hospital, New York.

ARTICLE IV.

EYE DISEASES DEPENDENT UPON SUPPRESSION OF MENSES. By READ J. McKAY, M.D., of Wilmington, Delaware, Member of the American Ophthalmological Society.

FOR several years past, it has been my endeavour to present to the annual meeting of the Delaware State Medical Society (where I had expected to read this paper this year, but was unable to attend to do so), practical papers upon eye or ear diseases, hoping thereby the more readily and promptly to promulgate the frequent and important relations existing between those diseases and general diseases, as our knowledge of special diseases increases in extent and exactness; and I have attempted to use language free from obscuring and mystifying technicalities, in order that the observations might be fully comprehended, for I have frequently thought specialists generally, by the manner in which they present important medical topics to their professional brethren in general practice, and to students in the lecture-room, fail to make the agreeable, intelligent, and lasting impressions which are always desirable and appreciated.

I now desire to present for consideration some clinical histories and practical remarks upon cases of eye diseases dependent upon abnormal menstruation, which have been under my care during the past nine years. As they are not very numerous I venture to report them fully, so that they may be studied critically. They only include cases of *eye diseases caused or complicated by suppression of menses*.

CASE I.—Fannie R., aged 22 years, single, domestic, United States, first came under my care at out-door department of Bellevue Hospital, New York City, June 30, 1873. She had had double-sight at intervals for two weeks past, and could not read or sew. She suffered with supra-orbital neuralgia. Two years previously she had suppression of menses. Since then her menses have been irregular, and the flow diminished in quantity. Vision of R. E. = $\frac{16}{200}$, of L. E. = $\frac{16}{80}$, and she could see small type ten inches. She was slightly myopic, but did not require glasses. Her pupils acted sluggishly under light. Ophthalmoscopic examination manifested appearances of well-marked neuro-retinitis. Free catharsis and bleeding of temples promptly improved her vision somewhat, and tonics her general health, when her menses became regular and she could again use her eyes. This improvement continued for several months, until suppression again occurred from getting her feet wet during "the flow," and again her eyes could not be used as desired. Several months later her menses again appeared and her eyes regained their normal condition. In March, 1875, she reported she had had a recurrence of partial suppression and eye troubles. In October, 1876, reported menses regular without any eye trouble, and her general health good, which continued a year later, the last report made to me.

CASE II.—Elizabeth H., German, aged 19 years, single, domestic, had been in United States over three years, came to "Bellevue Out-door Dept." July 6, 1874, for treatment for her eyes. At 14 years of age first had her menses, and not again until she was 18 years old, and the last time six or seven months previously. Eight days ago she began to have severe headaches, which prevented her sleeping well for several nights. She reported that when her headache was severe she had intense dread of light, but none without the pain in her head. Her near vision was good. Ophthalmoscopic examination revealed optic neuritis and retinal hyperæmia, which was more marked two days later, when she manifested symptoms of brain and spinal cord disease, and was sent to the hospital, passing from under observation.

CASE III.—Lucy J., aged 15, resident in New Jersey, came to the clinic at "Bellevue Out-door Dept." August 19, 1874, for dimness of her eyesight. She was very tall and large for her age. When five years old she had had a severe attack of external inflammation of her eyes (probably phlyctenular conjunctivitis). She has not been sick otherwise, excepting a weakness of her back, which began at 12 years of age. It was worse at time of menstruation, which began at 14 years of age, and she reported she had always been regular. About a year ago, when her menses first appeared, her eyesight began to grow dim, and has gradually grown worse. Six months ago frequent attacks of severe headache commenced, which lasted from half an hour to one hour. She had recently been treated at an eye infirmary by hypodermic injections of strychnia without beneficial effect. The vision of her R. E. = fingers ten feet, and read Sn. X — 4" to 6", L. E. V. = $\frac{20}{50}$, and read Sn. No. III. Ophthalmoscopic

examination manifested floating opacities in the vitreous humour of both eyes, which was much worse in the R. E., rendering its fundus somewhat indistinct, although its optic nerve looked very white. The L. E. manifested incipient disease of optic nerve and choroid. Leeches were ordered to be applied to her right temple. Two weeks later R. E. V. = $\frac{2}{10}$, and L. E. V. = $\frac{2}{30}$. Leeches applied to both temples, and tonic of syr. phosphate of iron, quinia, and strychnia ordered. Three weeks thereafter R. E. V. = $\frac{2}{50}$, and its fundus much more distinct, the floating opacities of vitreous smaller and less numerous. L. E. V. = $\frac{2}{20}$ minus, and its fundus clear. Leeches were again ordered to right temple, and to continue the tonic.

February 12, 1875, R. E. V. = $\frac{2}{30}$; L. E. V. = $\frac{2}{20}$, with fields of vision of both eyes limited above and internally. She reported that she had her menses last week, with severe headache for several hours daily for three days, and after it had great dimness of vision of L. E. for half an hour. July 21, 1876, she reported she had married and has a healthy baby. Vitreous of both eyes were clear, and R. E. V. = $\frac{2}{30}$; L. E. V. = $\frac{2}{20}$ minus.

CASE IV.—Miss B., aged 18, born in United States, was brought to my office by her family physician December 23, 1878. About seven months previously she began to have suppression of menses, which continued three months, when her eyes commenced to pain and manifest intolerance of light. Blistering her temples had been of temporary benefit, but relapses occurred at menstrual epochs. She has had double sight. Has now photophobia. Her pupils react fairly under light. R. E. V. = fingers five feet; L. E. V. = fingers six feet. Fields of vision of both eyes contracted, the L. E. more so than R. E. Ophthalmoscopic examination showed well-marked neuro-retinitis of both eyes, the fundus of L. E. being the one most inflamed. Advised leeches to temples, continuance of tonic, and an endeavour to secure a more free menstrual flow. She improved very little, and subsequently went to Philadelphia for treatment, where she unfortunately received no greater benefit, and her vision continues to be very greatly damaged.

CASE V.—Miss H., compositor, aged 18, born in United States, was brought by her father to me April 19, 1879, for painful and blurring vision, with frequent disturbances from double vision, which had prevented her using her eyes with comfort for months past. She had had a great deal of headache of late. Ascertained her menses were scanty and irregular, and she was subject to hysterical attacks. She had double sight (diplopia) to the right and left, and with R. E. alone. Her accommodative muscles were strained, as well as her internal and external recti. Ophthalmoscopic examination revealed congestion of her optic disks, also farsightedness with astigmatism. Glasses could not be selected without suspending accommodation with a solution of atropia, which was done after five days' use of it. They relieved her of all double sight, and greatly improved her vision for all distances, but her eyes would not permit her to resume her work (type-setting) for fifteen months or longer, not until her menses were established regularly.

CASE VI.—Miss W., aged 29, born in United States, domestic, came to me January 5, 1881, for dimness of vision and pain in her L. E., which began two weeks previously. A week later it pained all day, and three days later its sight became decidedly dimmed.

Her menses were irregular and scanty. They came on the day before

the sight was affected. When first examined the vision of her R. E. = $\frac{1}{2}$ in the poor light of a dark rainy day, and the L. E. could only see the hand indistinctly one foot distant. Ophthalmoscopic examination showed inflammatory deposits upon the posterior layer of cornea and opacities of the vitreous humour. Dilated the pupil at once with a solution of atropia, which promptly relieved her pain somewhat, and continued its use. Ordered smoked glasses, bathing the eye with hot water, and leeches applied to her temple on several different occasions, and internally bichloride of mercury, as well as directions to promote free menstrual flow, which was continued for several months. Her menses became free and regular, and she fully recovered her eyesight.

CASE VII.—Miss M., aged 26, school-teacher, presented herself in June, 1881, with asthenopia (weak and painful eyesight), and blephrospasm (frequent and spasmodic closure of her eyelids), due to straining of her accommodation. She had congestion of optic disks and refractive eye trouble, profuse leucorrhœa, and scanty menses. Suspended her accommodation and selected glasses for her, which promptly and greatly relieved her eye troubles, and advised her to have her uterine troubles attended to, which was done with benefit. In the fall she resumed her school duties. Six or seven months later, after mental worry and return of womb troubles, she reported, by letter, that her eyes again annoyed her, but she has not been able to visit me again.

CASE VIII.—Miss P., aged 23, born in Canada, was brought by her father to me July 23, 1881, to have her eyes examined, because she could not use them beyond a few moments without experiencing much pain and discomfort, although her vision was good for those few moments for all distances. She had considerable intolerance of light. When ten to twelve years of age she had nervous attacks of a choreic nature, and was kept from school for a year and a half, nor has she been permitted to go much since. She reported she had for several years past a great deal of headache, and her eyes had been very weak, without any external inflammatory symptoms. She has irregular menstruation with partial suppression. Ophthalmoscopic examination showed marked congestion of both optic disks, the right one the most affected. Between three and four months treatment for suppression re-established menses, and greatly improved her general health. The congestion of optic disks was relieved, and glasses were selected to relieve her compound far-sightedness whilst the eyes were under the influence of a solution of duboisia, and they gave her much comfort for some months thereafter. I hear she continues to do well, and has experienced much improvement not only from her eye discomforts but in her general health.

CASE IX.—Miss W., aged 24, a school-teacher, on December 24, 1881, called to have me examine her L. E., which manifested a sub-conjunctival hemorrhage, that had occurred eight days previously, during the time of her menstrual flow, which was scanty. She stated she had had partial suppression of menses for many months past. Lately, at those periods she had experienced great and unusual fulness about head and eyes. Her vision was good for all distances. No intraocular hemorrhage was found by ophthalmoscopic examination, but a slight haziness of both retinæ and congestion of optic nerves. Advised rest of eyes, and bathing with hot water, and to consult her family physician about re-establishing normal menstruation.

CASE X.—Miss P., aged 17, a school-girl, was brought to me January 27, 1882, by her mother for weak and painful eyes when used. Externally they looked well and healthy, and she was plump, rosy, and quite strong-looking. Two years previously she began to have great annoyance from headache and pain in her eyes, and she has had to stop going to school twice within that time on account of those sufferings. She had double-sight at times. Has suppression of menses. Vision was good, but she could not continue the use of her eyes more than a few moments with comfort. She was far-sighted, and trial of weak glasses improved her vision promptly, and gave comfort to her eyes; they were ordered for her, and it was advised to have the family physician correct her suppression. Not having heard further from her, I presume she progressed favourably.

CASE XI.—Mrs. B., aged 20, married fifteen months, called to see me March 28, 1882, about “a mistiness of sight” and intolerance of light, of two weeks’ duration. She had slight conjunctivitis, and so much hyperæsthesia of retinae that her pupils contracted to such a small size, that ophthalmoscopic examination was impossible until they were dilated with a solution of atropia, when a haziness of the retinae and congestion of optic disks were manifested, with far-sightedness. She had had suppression of menses for seven weeks. Local treatment of conjunctivitis gave her only partial and temporary relief. April 28th began an alterative course of internal treatment, which afforded her marked relief until the time her menses should have occurred on May 8th, but they did not, and she relapsed. She then had had suppression three months, but no other symptoms indicating pregnancy. Leeches were ordered to her temples, and a continuance of the medicine internally. May 30th she reported the leeching relieved her eyes and head considerably, and on the 22d, her menses came on, and she has felt still more improvement. Examination shows less retinal haziness, and less congestion of optic disks.

CASE XII.—Miss N., aged 15 years, came to see me April 29, 1882, with double-sight of five months’ duration, and inability to use her eyes longer than a few moments on account of spasm of accommodative muscles. She had not been able to go to school for past five or six years because of headache. Two years ago she had suppression of menses for three months, and then a severe spell of sick headache, since which time her eyes have troubled her. She had congestion of optic disks. Suspension of accommodation, with a solution of duboisia for selection of glasses to correct her near-sightedness, promptly relieved her of double sight, spasm of accommodation, and headache, and seemed to afford her much comfort.

It will be observed that all the successive foregoing cases were unmarried persons, except No. XI., and she was never pregnant. That the majority of them experienced their troubles near the beginning of their menstrual functions, or shortly afterwards. That all but one of them, No. IX., which had the subconjunctival hemorrhage, manifested diseases of the interior of the eye, and generally of the fundus, the optic nerves or retinae or both of both eyes, the most sensitive and important parts of the eye. It is recorded that five of them manifested double sight, and it is remembered that several others did also. Relapses occurred so often at the time of menstrual disturbance that the connection between them seems most conclusive. Also, when normal menstruation was re-established and maintained, their eyes gave them no further trouble.

They were all relieved except Cases No. II. and No. IV. The former soon passed from observation with grave symptoms of a cerebro-spinal character. The latter, when first examined, manifested the greatest loss of vision of any of them; fingers could be counted from five to six feet only, and internal examination revealed considerable inflammatory exudation into papillæ and retinæ, which threatened their atrophy with loss of function beyond recovery. Cases of this kind demand prompt recognition as to their etiology (before vision is too much impaired by the internal eye disease) in order that they may be successfully treated and relieved. Partial loss of vision, and inability to use the eyes in young healthy-looking females, *without external eye disease*, always suggest to my mind the probabilities of menstrual disturbances, and it is inquired about. As many more cases could be presented as the foregoing; but it is decided not to do so because they were not fully recorded, and could only numerically enlarge the observations I wish to present. Young school-girls often manifest asthenopia (weak and painful sight) about the time their menses are being established, and especially if their menses become irregular from any cause, which may produce partial or complete suppression for an indefinite time. I will not further pursue this subject to present illustrative cases, but state that sometimes they manifest decided congestion of optic papillæ and retinæ, and others no internal eye lesion, with the exception of strain of their accommodation which is common to all of these cases, for they have some refractive deformity of their eyes, which, sooner or later, causes their muscles of accommodation to rebel from their over-taxing and too continuous work.

The irregularities of the menopause period is often complicated with asthenopia and pathological lesions of the fundus of the eye. Several cases of this nature, with disease of the optic nerve and retina from their incipency to their complete atrophy, have been under observation recently.

Only uncomplicated cases as to their etiology have been selected for this paper, and all others excluded for various reasons, but especially for brevity, and to definitely establish the intimate and practical relations existing between eye diseases and menstrual disorders.

ARTICLE V.

ON THE MILD FORMS OF CONTINUED FEVER WHICH PREVAIL IN WASHINGTON, WITH SUGGESTIONS AS TO THEIR NATURE. By W. W. JOHNSTON, M.D., Prof. of the Theory and Practice of Medicine, Medical Department of the Columbian University; one of the Physicians to the Children's Hospital.

THE forms of continued fever which prevail in Washington may be classed as follows:—

I. Cases of typhoid fever with well-defined pathognomonic symptoms,

the temperature reaching and being sustained at a high point— 104° F.—and above, during the fastigium, ending in recovery in from four to six weeks, or terminating fatally from cerebral or intestinal complications or from hyperpyrexia.

II. Milder cases of typhoid fever in which the attack is shorter, the number of the associated symptoms is fewer, and their intensity less marked. A typical fever curve lasting eighteen to twenty-eight days is accompanied by one or more characteristic symptoms of no great prominence. The temperature may be high, 104° , during the early days of the fastigium, but there is after the eighth to the twelfth day a tendency to decline, and the mean of the high points during the acme will not be above 102.5° . Death may occur from accidents, as intestinal hemorrhage or perforation, or from the exhaustion of a relapse.

III. The series of cases included under a third class are those which have none of the symptoms clearly indicative of typhoid fever; there are no evidences of cerebral or intestinal disorder; constipation is the rule. The evolution of the attack is usually slow, the convalescence tedious, and marked by anæmia, emaciation, and debility. The course of fever lasts eighteen to twenty-one days, but the highest point may not be above 102° . In many cases the body heat is so low that without the thermometer fever could oftentimes not be detected. Yet a careful study shows that there is a preservation throughout of the character of the typhoid type. The patient lies in bed suffering but little, and wondering why he is kept there, but an indiscretion in diet, or a relaxation of the discipline suited to the case, will soon cause an elevation of temperature, with a consciousness of illness. When quinine is administered it lowers the temperature, but does not arrest the disease. During early convalescence, if solid food be given too soon, a relapse may occur which lasts as long and may be more serious than the original attack. Death may result from accidents, as perforation of the intestine or hemorrhage.

IV. In this class are embraced cases which last less than eighteen days, in which the fever is also of the continued type. In most respects they resemble the cases under the preceding class, except that the onset of the illness is sometimes sudden; there may be a rigor on the first day. The fever line reaches full development earlier, and then pursues a course like that of the cases in Class III., with the exception that it does not last so long, and that it is subject to greater departures from the typhoid type. Convalescence begins in from twelve to eighteen days. If a high point of temperature is reached, it lasts for a day or two only, when the patient is subjected to proper treatment by rest and diet. Quinine does not shorten the attack. Convalescence is slow, and a relapse may take place.

All the forms of continued fever occurring in Washington may be placed under one or the other of these divisions. While the diagnosis of cases in Class I. and II. is easily and correctly made, much difference of opinion

prevails as to the determination of the nature of cases which do not conform to the typical description of typhoid fever. In fact, the prevailing opinion is that mild forms of fever, without abdominal or cerebral symptoms, are of a malarial nature, this belief finding its expression in the term "bilious," or, more frequently, "remittent fever." This opinion is based upon the following reasons:—

1. The general prevalence at the same time of intermittent fever and of continued fevers of the forms described.
2. The coincidence of undoubted malarial disease and mild continued fevers in malarial districts.
3. The supposed existence of intermittent features in the early and later stages, and of decided remissions in the fastigium of the continued forms.
4. The supposed benefit derived from quinia in shortening the attack, and in converting a continuous into an intermittent form of fever.
5. The absence of the typical symptoms of typhoid fever.

If these arguments are examined in detail, and tested by a strict observation of facts, quite opposite conclusions can be reached.

1. The prevalence of malarial illness and of continued fevers of doubtful nature in the same season of the year does not support the idea of their identity. The season of intermittent fever, the most typical form of malarial disease, is also the time when typhoid fevers of the severest type most prevail. In the year ending June, 1879, in the District of Columbia, there were seventy-four deaths from typhoid fever; of these fourteen were in July, ten in August, fourteen in September, fourteen in October, two in November, one in December, two in January, two in February, two in March, five in May, and five in June. In July, August, September, and October there were *fifty-two* deaths, and in the remaining eight months only *twenty-two* deaths.

2. The presence of continued fever side by side with malarial disease in the same house and in the same part of the city does not establish their identity. Typhoid fever is found everywhere, irrespective of the proximity to the sources of malarial poison, and, therefore, necessarily is found in malarial districts. The general distribution of typhoid fever in Washington is well shown in the admirable map published by the Health Officer in the Report of 1880.

3. A careful testing of the temperature changes in the early stages, and during the progress and decline of these fevers, will not show intermissions, or decided remissions at any time. *It is the neglect to use the thermometer, and to rely upon it*, rather than on the unskilled observation of the patient or of his attendants, which originates and sustains this error.

4. Quinia has great potency in reducing temperature, but its effects cannot be offered as reasons for the diagnosis of remittent fever, unless the fever exacerbations are stopped and the normal point is reached and main-

tained through its influence. The mistake is often made of taking the remissions due to the drug for the oscillations of the disease. If the fever is only lowered, the daily rise recurring when the remedy is not given, while the general features of the disease remain unchanged, it may be concluded that the attack is not malarial. Such, indeed, is the result when quinine is administered in the fevers under consideration.

5. The absence of the symptoms which are more distinctive of typhoid fever is usually made the ground for calling the attack "malarial," and hence "remittent" fever. And as these two—typhoid and remittent fevers—are the only idiopathic continued fevers commonly met with in this city, a case must belong to the one or the other category. But is this exclusion of typhoid fever based upon just and sufficient grounds? We admit in the contagious class of zymotic diseases a gradual diminution of intensity, due to the modified virulence or the smaller dose of the *contagium vivum*. In the eruptive fevers there is a regular gradation in the number and severity of the symptoms, from the malignant to those so mild that the true nature of the slight indisposition is recognized, as in diphtheria and scarlet fever, by its sequelæ alone. If a study is made of a series of cases of continued fever of diminishing intensity, as are represented in the four classes enumerated above, it will be seen that one case differs from that which preceded it, by losing one symptom, or by having that symptom in a less marked form; and thus in the whole series the same disease is deprived one by one of its characteristics, but retains to the last the fever which adheres more or less to the typhoid type, with its daily remissions and exacerbations. The study of the temperature best illustrates the minimizing of intensity. Preliminary to such a study, the rule laid down by Wunderlich must be forgotten, that we can exclude typhoid fever, if, "in young adults . . . during the fastigium . . . the evening temperature keeps under 39.6° C. (103.28° F.);" and again, "We may exclude typhoid fever, when between the fourth and sixth day, the evening temperature in a child, or adult under middle age, never reaches 39.5° C. (103.1° F.), and, indeed, if it has failed to do so two or three times." This law was announced fifteen years ago, and has without doubt influenced observation and delayed the general recognition of the milder forms. Wunderlich relieved himself to some extent of the dogmatism contained in this assertion by saying that, "in this pre-eminently typical disease not a single rule can be laid down which is not subject to exceptions." The teachings of Liebermeister, Jürgensen, Cayley, Wilson, and others have shown that *there is no minimum limit to the temperature of typhoid fever*, and that no matter how low the elevation is in the fastigium, the disease may nevertheless be of this nature. In cases which I have observed and kept records of during the last thirteen years, some of which were published in an article on "Mild Forms of Typhoid Fever," in the *American Journal of the Medical Sciences* for October, 1875, there

can be found a descending scale of febrile intensity which, beginning with the highest temperatures, ends with maximum elevations of about 99.5° .

The occurrence during the progress of the mildest case of fatal accidents, which definitely fix the nature of the case in question, aids in the diagnosis of cases like them. I have been so strongly impressed by cases of this kind, that I look upon the mildest form as requiring closer attention and better nursing than those of a more serious nature, as the patient as well as the disease must be kept under strict discipline. The following history will illustrate this point:—

Mr. H., after complaining of ill health for three weeks, was taken with fever on June 23, 1877. He went to bed on the following day, suffering from headache, pains in the limbs, loss of appetite, and great weakness. The bowels were constipated. I saw him on June 27th; the temperature in the evening was 101° , pulse 100. The tongue was coated, the abdomen was not tympanitic, and the bowels were moved by enema only. There were no rose spots, and no delirium. Rest in bed and liquid diet ordered. June 28. Temperature A. M. 101° ; pulse 108. P. M. temperature 102° ; pulse 110. June 29. Temperature A. M. 101.2° ; pulse 100. P. M. temperature 102° ; pulse 112. June 30. Temperature A. M. 101.6° ; pulse 110. P. M. temperature 102.4° ; pulse 116. For one week from this date his condition changed daily for the better; the temperature descending, and the pulse becoming less frequent. He did not seem ill, and did not complain. The bowels were moved by enema or by castor oil every alternate day. Eructation of gas was the only symptom which annoyed him. The treatment of absolute rest and liquid nourishment was continued. No other symptoms than those described were developed.

July 8. The sixteenth day of his attack, the temperature was 99.8° F., and an early convalescence was predicted. Rest and the same diet of liquids enjoined.

9th. At 8 A. M. he was taken with vomiting, and a violent pain in the abdomen, which soon became tense and painful; he was restless and very thirsty. The temperature had risen to 104° and continued to rise, and the pulse was 154. During the day he sank into collapse, with cold sweats, and died at 10 A. M. on the following day. The diagnosis of typhoid fever was justified by symptoms pointing so clearly to intestinal perforation.

In the epidemic of typhoid fever which prevailed in Washington in September and October, 1881, abundant opportunity was given to examine this question, as mild forms of fever predominated and were seen in every phase of intensity. The facts properly classified and studied in their mutual relations lead inevitably to the conclusion, that there is no justice, but *positive error in affixing the term "malarial" to all negative and doubtful cases of continued fever*, as is the habit in diagnosis wherever the malarial and typhoid disease appear side by side. The escape from the dilemma of uncertainty by offering a hybrid name to doubtful cases is illogical, because unnecessary and unsupported by any facts which have so far been presented. The conception of typho-malarial fever has come to be a device for easing one's self of the responsibility of accuracy in

diagnosis, and gives us a no better working theory, as far as practical results go, than we had before.

The conclusion, that a large number of *negative and doubtful forms of continued fever occurring in Washington are mild forms of typhoid fever*, is therefore supported by theoretical considerations as well as by the facts. With the filling in of marsh land, and the paving and draining of the streets, Washington is rapidly losing the conditions which gave origin to marsh poison, and is acquiring those conditions which give rise to the virus of typhoid fever. In London, along the banks of the Thames, where ague formerly prevailed, enteric fever is the common disease. (Harley, in *Reynolds's System of Medicine*.) "Enteric fever takes the place of malarial fevers as the population becomes more dense." (Wilson.) Such a change is now going on in Washington, and the problem is here presented, as in other large and densely populated cities, of eradicating this growing scourge. The circumstances of origin no doubt vary with localities, and much good would be derived from a close study of the topographical and geographical differences of typhoid fever, which has a more extended distribution throughout the world than any other of the zymotic diseases. In the Report of the National Board of Health, for Saturday, November 12, 1881, containing mortuary statistics, compiled from the weekly consular reports, deaths from typhoid fever are reported from Havana, Rio Janeiro, Rosario (Argentine Confederation), La Guayra (Venezuela), Dublin, Glasgow, Dundee, London, Cardiff, Lyons, Amsterdam, Berlin, Breslau, Brunswick, Cologne, Leipsic, Dresden, Vienna, Bucharest, Seville, Malaga, Rome, and Shanghai. Not only is it found in North and South America, the West Indies, England, Ireland, Scotland, the Continent of Europe, Australia, Asia, and Africa, but it is one of the most fatal diseases wherever it exists, sometimes the most fatal even in the homes of cholera and yellow fever. In Algiers, for the four weeks ending July 31, 1881, typhoid fever stands first on the list of zymotic diseases in fatality; phthisis pulmonalis and bronchitis alone out of all diseases causing more deaths. In Buda-Pesth, Hungary, for weeks ending August 13th and 20th, typhoid fever heads the list of deaths before smallpox and scarlatina.

In Calcutta, for the week ending July 30, 1881, typhoid fever caused sixteen deaths; cholera, nine deaths.

In Melbourne, Australia, during June, 1881, typhoid fever resulted fatally in sixteen cases, causing two-thirds as many deaths as all the other zymotic diseases.

In Rio Janeiro, for three weeks ending August 20, 1881, there were as many deaths from typhoid fever as from yellow fever, and this in the home of yellow fever. "Pernicious fever" had three times as many deaths as either.

In Paris, for one week ending September 3, 1881, there were as many deaths from typhoid fever as were reported in Washington for the whole year 1880.

In the United States it is one of the most fatal, sometimes the most fatal, of the zymotic diseases. From the mortality lists of the cities requiring certificates of death, for the week ending September 19, 1881, there were 201 deaths from typhoid fever, 137 from diphtheria, 118 from malarial disease, 88 from scarlet fever, 61 from smallpox; that is, typhoid fever caused 83 more deaths than malarial fevers, and 64 more than diphtheria.

For the week ending September 9, 1881, typhoid fever caused in the same cities 162 deaths, diphtheria 161, malarial diseases 88, scarlet fever 51, smallpox 72; here, too, typhoid fever heads the list.

For week ending October 15, 1881, there were 213 deaths from typhoid fever, 89 from malarial diseases, diphtheria 181, scarlet fever 72, smallpox 91; that is, typhoid fever had twice as many deaths as malarial fever, at a time when miasmatic influences are most prevalent; 32 more deaths than diphtheria, and three times as many as scarlet fever.

For week ending October 29th, typhoid had 213 deaths, malarial fevers 105, diphtheria 216, scarlet fever 91, smallpox 102. Typhoid had twice as many deaths this week as malarial fevers, but three less than diphtheria.

But what is a more remarkable showing than this is contained in the Report of the Health Officer of New York for quarter ending September 30, 1880, and September, 1881. According to this statement, the most fatal zymotic disease, in proportion to the number of cases attacked, was typhus fever. The next most fatal was typhoid fever; and the third was diphtheria. Allowing for errors from failure to report cases of typhoid fever (a neglect much less likely to occur with typhus fever, as the cases are few, many of them being under treatment in hospitals), it is still evident that typhoid fever is becoming the most fatal epidemic and contagious disease of this country.

In an interesting report on typhoid fever in Wheeling, West Virginia, made by Dr. S. L. Gepson, and published in *The Medical News* of June 3, 1882, there is shown to have been a great increase in the prevalence of this disease during the last two years in that city.

The mortality tables for Washington and the District of Columbia for the year 1880 show that there were 84 deaths from typhoid fever, being 1.99 per cent. to total mortality. In Wheeling, for the same year, it was 8.81 per cent. Leaving out diarrhoea, with a mortality of 157, cholera infantum with 198 deaths, the extraordinary death-rate of which is limited to infants and children, typhoid fever caused more deaths in Washington during the year than any other zymotic disease. Scarlet fever has 28, diphtheria 27, whooping-cough 50 deaths. Typhoid fever, therefore, destroyed three times as many lives as scarlet fever or diphtheria.

The time is, doubtless, quite far removed when we can hope to stamp out typhoid fever by finding and destroying the poison-germ before it

begins its deadly flight and diffusion. Improvements in drainage, in cleanliness, in the general healthfulness of a city do not destroy it, as is fully demonstrated in Washington. There is no city in the world, perhaps, which is kept more rigorously clean than this, and where the work of systematic improvement has been accomplished more rapidly. There is no commerce, traffic, or manufactures to generate disease from filth and the overcrowding of a large labouring class. The negro population, it is true, live under the worst sanitary conditions, and, but for this, the death-rate would be much lower than it is. But, notwithstanding this drawback, epidemic and contagious diseases have here no great severity or prevalence. And yet typhoid fever is not decreasing, but is becoming, as in other Atlantic cities, *the* endemic fever.

The following conclusions include the chief points which it is desired to draw attention to in this communication :—

1. As malarial diseases are lessening, typhoid fever is increasing in Washington, the increase being largely due to the greater number of cases of mild and irregular type, which, if properly treated, are rarely fatal.

2. Mild and irregular forms of typhoid fever are still erroneously regarded as malarial in nature.

3. By adopting a more rigid discipline and more appropriate treatment, based upon this conclusion, to mild forms of fever of negative character, now called “malarial fevers,” “bilious fevers,” “remittent fevers,” or “gastric fevers,” the mortality from continued fever would be much diminished.

ARTICLE VI.

A CASE OF AMPUTATION AT THE HIP-JOINT, IN WHICH PROF. TRENDLENBURG'S METHOD OF CONTROLLING HEMORRHAGE WAS RESORTED TO WITH RECOVERY OF THE PATIENT. By THEODORE R. VARICK, M.D., Surgeon to Jersey City Charity Hospital, and Medical Director of, and Surgeon to, St. Francis's Hospital, Jersey City, N. J.

WM. F., æt. 13 years, was admitted to St. Francis's Hospital February 14, 1882, on account of a comminuted fracture of the right leg and thigh. The integument being intact, it was determined to make an effort to save the limb. The endeavour proved abortive, as profuse suppuration ensued, with necrosis of the bones, accompanied with severe hectic symptoms. A consultation of the hospital staff was held, and it was decided to amputate at the coxo-femoral articulation.

In view of the extreme prostration of the patient, and the manifest necessity of reducing the loss of blood to a minimum, I determined to resort to Prof. Trendelenburg's method of controlling hemorrhage in this operation. I accordingly had manufactured by Tiemann & Co., of New

York, the instrument which is thus described: "A steel rod 38 ctm. long, 6 mm. broad, biconvex on section, and 2 mm. thick at the centre, with blunt edges, but provided with a movable lance-shaped point 5 ctm. long."

The operation, as performed by Prof. Trendelenburg, is to pass the rod obliquely through the soft parts in front of the joint, in the same way as the two-edged knife in the well-known method of Lisfranc, only 2 ctm. higher. The rod enters, therefore, about 4 ctm. below the anterior superior spinous process of the ilium, passes between the femur and the femoral artery, and emerges at the fold of the scrotum. The point is now removed, and an elastic tube or band firmly wound in figure-of-eight fashion round the ends of the rod, and passing in front of the thigh. In this way the great vessels of the thigh and all the soft parts in front of the joint are compressed. Lisfranc's knife is then introduced 1 to 2 ctm. below the rod, and by cutting from within outwards in the usual way, the anterior flap is formed. Having ligated the vessels, and removed the compressing band and rod, Prof. Trendelenburg next disarticulates the joint, and then forms the posterior flap in a similar manner. For further particulars regarding Prof. Trendelenburg's method the reader is referred to the number of this Journal for April, 1882, pp. 582 and 583.

June 13, 1882, in presence of Drs. J. E. Culver, Finn, McGill, McLoughlin, and W. W. Varick, of the Medical and Surgical Staff, and Dr. H. A. Long, Assistant Surgeon of St. Francis's Hospital, Drs. R. F. Chabert and Gillman, of St. Mary's Hospital, Hoboken, also Dr. Bidwell, of Jersey City, and Mr. Jos. Wolfsen, medical student, the patient was fully anesthetized and the rod introduced, and compression applied as described above.

The anterior flap was made by transfixion and cutting from within outwards. There was a discharge of venous blood from the dilated veins on the distal side of the incision, and one artery at the bottom of the wound required a ligature, not being included in the compression.

Thus far the operation followed the steps of that of Prof. Trendelenburg. Instead of disarticulating the joint at this time, I passed the rod through the posterior part of the limb, grazing the cervix femoris posteriorly, and brought the point out one inch below the point of egress of that of the anterior flap. Compression was applied in the same manner, and the posterior flap formed by cutting from without inwards, the incision commencing about half an inch below the point of egress, and carried through the integuments and muscular tissue to the bone, and terminating as near as possible at the point of entrance of the rod. The capsular ligament was opened posteriorly, and the limb being carried across the abdomen, the joint was readily disarticulated. Two or three small arterial branches were ligated, after which the compression was removed.

Excepting the unloading of the enlarged veins on the distal side of the site of operation, there were not two ounces of blood lost. The wound was left open, and dressed with carbolized vaseline and oakum; after which an anodyne was administered, which produced several hours of refreshing sleep.

Thirty-six hours after the operation the wound was dressed, and bals. fir substituted for the vaseline.

On the tenth day the last ligature came away, and as granulations were springing up rapidly, adhesive straps were applied, gradually approximating day by day the edges of the wound.

The following table indicates the diurnal pulse and temperature:—

	Pulse.	Temperature.	
		A.M.	P.M.
June 14.	120	98 $\frac{1}{2}$	99 $\frac{1}{2}$
" 15.	130	100 $\frac{1}{4}$	99 $\frac{1}{2}$
" 16.	120	99 $\frac{1}{2}$	99 $\frac{1}{2}$
" 17.	120	98 $\frac{1}{2}$	99 $\frac{3}{4}$
" 18.	120	99 $\frac{1}{2}$	101 $\frac{1}{2}$
" 19.	118	99 $\frac{1}{2}$	99 $\frac{3}{4}$
" 20.	110	99 $\frac{1}{4}$	99 $\frac{3}{4}$
" 21.	110	99 $\frac{1}{2}$	100 $\frac{3}{4}$
" 22.	100	98 $\frac{1}{2}$	101
" 23.	100	98 $\frac{1}{2}$	100
" 24.	110	99 $\frac{1}{4}$	100 $\frac{1}{4}$
" 25.	100	98 $\frac{1}{2}$	100
" 26.	96	98 $\frac{1}{2}$	99 $\frac{1}{4}$
" 27.	96	100	98 $\frac{1}{2}$
" 28.	94	98 $\frac{1}{2}$	99
" 29.	90	100	99
" 30.	90	98 $\frac{1}{2}$	98 $\frac{1}{2}$
July 1.	90	98 $\frac{1}{2}$	98 $\frac{1}{4}$

The occasional temporary increase of temperature was no doubt due to the intensely warm weather which prevailed at the time.

The subsequent progress of the case presented nothing worthy of note, being one of uninterrupted recovery. The patient was discharged cured July 31.

Apart from the fact that this case adds one more to the list of successful amputations at the coxo-femoral articulation, the main interest centres in the comparatively bloodless character of the operation.

The risk of compression of the nervous structures contained in the abdominal cavity by the use of either Lister's or Pancoast's tourniquets is avoided, as is also the repulsive method by means of Davy's lever. The compression of the part is absolute, and from the fact that the rod lies in a channel of its own making, slipping is impossible. It will be observed that there is a narrow tract between the anterior and posterior points of insertion of the rod which is not subject to compression at the time of operation, and from which it is possible for some arterial hemorrhage to occur.

In this case one vessel of considerable size, probably a branch of the profunda, required ligature; the rod in its anterior insertion passing in front of the vessel.

Excepting one or two small muscular branches, which were controlled by torsion, this was the only artery from which a drop of blood was lost.

It seems to me, instead of bringing the point of the rod out "at the fold of the scrotum," that if it was directed more posteriorly or nearer the tuber ischii, the risk of missing any of the larger arterial branches would be avoided.

The experience of this one case, which so far as I know is the only one in which this method has been resorted to in America, is eminently satisfactory, and commends itself as fulfilling the indications more perfectly than any heretofore described.

ARTICLE VII.

EUCALYPTUS GLOBULUS IN GYNÆCOLOGICAL PRACTICE, TOGETHER WITH AN ACCOUNT OF SEVERAL CASES IN WHICH IT WAS USED. By ANDREW F. CURRIER, M.D., of New York.

THIS drug is destined to play an important part in gynæcological therapeutics. It is only since 1865 that its therapeutic action has been tested, and, with the cloud of new remedies constantly before the attention of the profession, it has not received the full trial which it is sure to get eventually. (See an article upon the subject by Vogl in *Real-Encyclopädie der Gesammten Heilkunde*.)

It first excited investigation on account of the real or supposed action of the growing tree in countries where it is indigenous, as a dissipator of *malaria*. From Australia, its home, it has been transplanted to other countries, primarily on this account. Its transportation to the domain of experimental medicine was an easy and natural step. An oil was extracted from its large and beautiful leaves, fragrant and powerful. The physiological experimenters, chief among whom was Mosler, found that it was useful not only on account of its antiperiodic effects, but as an anti-phlogistic, its function being to diminish the action of the heart, and the blood pressure. When applied to the mucous membrane of the mouth, it caused a sensation of heat, followed by that of dryness. On mucous membrane, in general, it was found to be stimulant, astringent, and antiseptic; hence a wide variety of uses was suggested, as in diphtheria, various lung troubles, gonorrhœa, and, in general, inflammations of the mucous membrane, of the bladder, vagina, and rectum. Mees affirmed that it held the highest place as an antiseptic (*loc. cit.*). Schultze says its oil is not only a powerful antiseptic, it also stimulates granulations. Its solution not being readily effected, he gives, as a formula for an emulsion: Ol. eucalypti, 3 parts; alcohol, 15 parts; water, 115 parts. (*Centr. für Gynäkologie*, No. 34, 1881.)

In May, 1881, at a meeting of the London Clinical Society a fatal case of carbolic acid poisoning was reported, following an operation done with antiseptic precautions. Mr. Lister was at the meeting, and admitted that the facts were undoubtedly as stated. He then announced that in Eucalyptus Globulus was found an antiseptic almost entirely free from danger,

with an agreeable aromatic odour, and without many of the objections which pertain to carbolic acid.

We could not expect such an agent to be absolutely free from danger, for the laws governing the action of antiseptics are doubtless similar or nearly so in their application to low forms of animal life and to the cellular organization of the human being, which causes us to wonder that accidents from their use are so comparatively infrequent. The objections to preparations of *Eucalyptus* are their expense, their insolubility in water, and their volatility. The oil combines very well, said Mr. Lister, with resin and dammar gum. (*Lancet*, 1881, vol. i. 837.) The literature of the subject is very meagre, and I could find but one reference to its use in gynæcological practice. (De l'hydrate de chloral associé à la teinture d'eucalyptus dans la traitement du cancer de l'utérus—*Gaz. Obstetricale*, vol. v. 682.)

I was directed to use the drug by Dr. James B. Hunter as an anæsthetic in several severe cases of ovaritis in his service at the Woman's Hospital, during the winter of 1881-2, at which time I was serving there as house-surgeon. The results were very satisfactory, as I shall endeavour to show. The preparation used was a solution composed of equal parts of the fluid extract of eucalyptus and glycerine. Dr. Hunter told me that he sometimes used the unmixed and undiluted oil in his private practice upon gynæcological patients, its effects being very satisfactory. Dr. Frank P. Foster has had a preparation made, composed of the oil of eucalyptus and iodoform, with the happy result of entirely destroying the disgusting odour of the latter drug. The combination will undoubtedly be a very efficient one. The cases upon which the observations were made were the following :—

CASE I.—Mrs. M., aged 33, admitted to the Woman's Hospital September 22, 1881. She has been married nine years, and was never pregnant. She has been complaining for four years, especially with pains in the back, extending to the sides and down the thighs. Menstruation began at thirteen, was scanty in quantity until two years since, when it became more profuse. It usually lasts four days, and is accompanied by bearing-down pains in the abdomen and right thigh. For two years she has had attacks of pelvic inflammation during the months of January and February. Micturition is painful and frequent, and sometimes bloody. Walking causes pain in the right side. The bowels are constipated and movements are accompanied with pain in the rectum and womb. A diagnosis of retroversion, prolapse of the left ovary, and cellulitis was made, and during the next five months in addition to the usual vaginal douches of hot water, twice daily, numerous pessaries were tried and removed after a short time, on account of the irritation and pain which were caused by them. When the uterus was not sustained by a pessary, cotton pads soaked in glycerine were used for the purpose. At times the patient seemed much benefited and could go about very comfortably; then the old condition would recur, and as much pain and discomfort be present as before.

About the 1st of March the eucalyptus preparation was tried, about half an ounce being distributed upon several pledgets of cotton with which the vagina was lightly tamponed. This was repeated every day or nearly every day, for several weeks, with great relief from the local and reflex pain. She became more comfortable than she had been with the applications previously in use.

CASE II.—Mrs. R., aged 31, admitted Nov. 5. She was married eleven years ago, has had one child, and her labour was very severe. It was three days in duration, and the child was instrumentally delivered. Since that time she has been sick continually. Menstruation began at seventeen, lasts from three to four days, is normal as to quantity, and is preceded by pains in the sides, abdomen, and back before the flow appears. This pain continues during the period, and does not cease until several days after that has ended, being of a very severe character.

Diagnosis—Retroversion—Sub-involution of the uterus—Prolapse of the left ovary. Very much the same treatment was adopted as in Case I., with very little benefit, until the eucalyptus was tried. This had a very satisfactory effect in subduing the pain, and if, for any cause, the daily application were omitted, the pain and discomfort returned.

CASE III.—Mrs. F., readmitted Nov. 7, aged 29. She was in the hospital a year ago, and was operated upon for laceration of the cervix. The operation did not bring the hoped-for recovery. The uterus remained large and exquisitely tender, and there were severe pains in the back and left side, exaggerated at the menstrual epoch. Menstruation takes place every three weeks, and is scanty as to quantity. She also suffers from pain and a burning sensation during micturition. Examination showed the womb to be retroverted, firmly fixed, and much enlarged. The left ovary was enlarged, prolapsed, and excessively tender. For treatment, she received the hot-water vaginal douches twice daily, iodine was applied to the vaginal vault, and the uterus was supported by a cotton tampon. In three weeks the uterus was quite movable, but the patient still complained of almost constant pain. This treatment was continued for the following three months, resulting in bringing the uterus back to its position, reducing its size, and relieving the pain to a certain extent; then the eucalyptus mixture was tried, applied daily, and its anæsthetic effect was very marked. The cotton pledgets were applied while the patient was in the knee-chest position, and pressure was brought to bear directly upon the prolapsed ovary.

CASE IV.—Mrs. S., aged 30, admitted January 20. She has been married fourteen years, and has had one child, which was born twelve years since. She has been complaining since her confinement with pain in the hypogastrium, back, and thighs. Menstruation began at twelve, and was regular and normal until the birth of her child. At the present time the flow is scanty and of offensive odour, accompanied with pain during the first day. Walking is painful, and so are movements from the bowels. The uterus is retroflexed, and both ovaries are prolapsed, the left one more than the right. Improvement was marked at the end of a month, under the same treatment as that received by the other cases detailed. The use of the eucalyptus was begun when it was begun with the others. The effect was not so positive, probably because the woman did not suffer such acute pain as Cases I., II., and III.

CASE V.—Mrs. G., aged 36, admitted February 16. She has been married eleven years, has had two children, the last of which came five years since, and was delivered with forceps. Her menstruation has been

regular. She has pain in the back and hypogastrium, also nausea and vomiting for a week before the flow comes. The flow lasts two days, and is scanty as to quantity. She is obliged to pass water frequently. Walking causes pain in the hypogastrium. The bowels are constipated. A laceration of the cervix was closed two years since.

Diagnosis—Retroflexion and prolapse of the left ovary. The case was treated precisely like the others, and with the same satisfactory relief to the pain when the eucalyptus was used.

In none of these cases which have been described, is it claimed that a cure has been effected by the use of the substance under consideration. They were selected because they were typical cases of a disease in which pain is a constant and harassing feature. This must first be met, and then, in conjunction, the mechanical and constitutional means of treatment. Every substance which lessens the amount of pain in the universe, and which may be safely used under proper restriction, is a boon to humanity. The number of such substances used in gynecological practice is quite small, and I consider eucalyptus a valuable addition. Besides its anæsthetic effects, it is, as we know, antiseptic and antiperiodic, and hence it will be of use in that large class of cases where foul-smelling discharges exist, and also as an adjuvant in the treatment of malaria. The absorptive function of the vaginal mucous membrane has been comparatively little employed in constitutional treatment, and this is a field which yet remains to be worked up. A daily application of this substance must have more than a local influence. It will usually be difficult to give treatment so frequently, excepting in hospital practice. Much better results would follow could a continuous effect of this, as well as of some other means of treatment be obtained, but the expense and the annoyance, and in many cases the dread of pain prevent. The very fair degree of success obtained in treating the cases described in this paper, leads me to believe, that in less severe cases we can feel almost positive that we can give great relief, indeed, my experience in private practice confirms that belief. In a quite different class of cases eucalyptus will also be serviceable. I refer to wounds of the breast after the removal of tumours. With the increasing favor of the open method of treating such wounds, especially when the growth removed has been of a cancerous nature, its stimulant and antiseptic properties will prove very acceptable.

ARTICLE VIII.

A CASE OF OPERATION FOR THE REMOVAL OF AN ABDOMINAL TUMOUR, WHICH WAS FOLLOWED BY THE FORMATION OF A STERCORACEOUS FISTULA IN THE CICATRIX. By LOUIS W. ATLEE, M.D., of Philadelphia.

My father, Dr. Walter F. Atlee, has published in this Journal several cases in order to relate some immediate and remote consequences of ova-

riotomy. In the number for July, 1877, he relates a case of menstruation through the cicatrix; in the one for April, 1880, one of death in labour, from difficulties attributed to shortness of the pedicle secured by a clamp; and in July, 1880, is related a case in which phlegmasia dolens followed the operation.

There have been very recently several contributions to medical literature on this subject, one of them is "Les suites éloignées de l'ovariotomie," par le Dr. Le Bec, in the *Archives Générales de Médecine* for June and July, 1882; and another is a "Note sur quelques accidens consécutifs de l'ovariotomie," Paris, 1882, taken from the *Annales de Gynécologie* for 1881.

I wish to report the following case of abdominal section for the removal of a tumour, on account of the strange and remarkable consequence by which the operation was followed, as a contribution to the, as yet, very imperfect surgical literature upon this subject:—

Miss S. came to my father's office, November 5, 1875, on account of a lump that she had found growing in the left iliac region, and was then about the size of a goose-egg. She had the appearance of good health, was 32 years of age, single, and a seamstress. She had hernia (congenital) of the left side, for which she had worn a truss as long as she could remember. Menstruation began at eighteen, and was always very regular until the last period, when it was delayed a week over the usual time.

In the time intervening between November 5, 1875, and April 22, 1876, she was several times in the office. She complained that her bowels would not move without medicine, and that she had some trouble in passing water, having to strain for some time before it would begin to flow. Menses were still regular; tumour was growing but slowly. She measured twenty-six inches around the waist. No operation was advised. My father wrote to Dr. B. in almost the exact words of Spencer Wells: "So long as an ovarian tumour does not interfere with the appearance, prospects, or comforts of the patient; so long as no injurious pressure is exercised by it on the organs of the pelvis, abdomen, and chest; so long as heart and lungs, digestive organs, kidneys, bladder, and rectum perform their functions without much disturbance; so long as there is no great emaciation, no very wearying pain, no distressing difficulty in locomotion, or so long as any injurious influence can be counteracted by ordinary medical care, the patient should be left to this care, undisturbed by any surgical treatment."

March 5, 1877. Measured twenty-eight inches. Abdomen was softer and more uniformly distended; before, the left side was the more prominent.

In the spring of 1881 she had what the attending physician supposed to be a peritonitis, but which passed off, leaving her weaker and subject to recurring attacks of nausea. This condition lasted until the operation, the tumour growing much more rapidly during the ensuing year than ever before.

April 25, 1882. She had lost flesh, and from the large size of the tumour many most important functions were painfully performed. The operation was fixed for the 4th of May. She then measured forty-six inches. After she was placed upon the operating table (a patent-ironing table), the abdomen was carefully examined, and all said that it was

undoubtedly a multilocular ovarian cyst. Among those present were my grandfather, Dr. Atlee, of Lancaster, Dr. Robert P. Harris, of this city, and Dr. Hartman, of Santiago, Cuba, all men of large experience in cases of this kind. It was an elastic nodulated mass, filling up the pelvis, and reaching to the xyphoid appendix. On making an incision and exposing the tumour, it was found to be solid; a trocar was plunged into it, but nothing came away. The incision was then enlarged, extending from the umbilicus very nearly to the pubis; the adhesions were numerous, but easily torn; the mass was then slowly and with great difficulty delivered through the incision; there was no pedicle; the wound was sewed up immediately; no toilet of the peritoneal cavity was made, in the belief that there is more danger in exposing it to the air and prolonging the operation, than there is in the presence of a small quantity of blood. For such an operation there was very little shock; fifteen minutes after removal from the operating table she had recovered from the effects of the anæsthetic; she asked to see the tumour, and, when it was shown her, made some jocular remark.

All present were pleased with the operation, and no one thought anything untoward had occurred; there was no reason to suppose any injury had taken place to the intestine.

During the two days following the operation there was considerable nausea and vomiting of mucus; no particular pain; a feeling of uneasiness in the abdomen, for which she took and was relieved by three one drachm doses of the liquor morph. sulph. Each day the nausea and vomiting lessened, though it could not be arrested by any of the measures usually used.

Two days after the operation a nutritive injection of broth was ordered (3ij); it was followed in an hour by a motion of the bowels. During the following night and morning several more motions came from the bowels; they were thin and very offensive; through the day they continued very numerous; the nurse was frightened, and asked for something to stop them, but, as the passages were so offensive, they were looked upon as a provision of nature to get rid of something hurtful, and such seemed to be the case, as they soon became less numerous and offensive; the nausea and vomiting were much relieved by the removal of so much offensive matter.

Until the fifth day her diet was confined to a little broth, but she was allowed then a mutton-chop. This day also her monthly sickness came on; the wound was healed nicely, and three of the five sutures were removed; strips of plaster were substituted to guard against all danger of reopening. Thus she went on doing well, and before the tenth day had sat up and breakfasted. She complained of nothing except being considerably distended with wind, notwithstanding that she wore a tight and well-applied bandage.

But exactly on the fourteenth day after the removal of the tumour she "felt like eating a banana," and the woman took one and ate it. A few hours after eating the banana, she became enormously distended, and felt something give way. The nurse, on taking off the bandage, found the upper part of the incision had been forced open, and that fecal matter was being evacuated through it. During the two following days a great deal of feces came through, other fistulæ formed along the incision, and two others where the sutures had passed through. The patient suffered little, if any, from this, except the great annoyance caused by the discharge and

its odour. In the upper part of the rectum was a mass of hardened feces. Injections of oxgall were given, but, as the injection came out immediately at the fistulæ, it had not time to act on the hardened mass. For two weeks they were used (once or twice every day), and the mass being smaller came further into the rectum, from which it was easily removed. The patient did fairly well, the feces coming away naturally, but still a little passed out at the fistulæ, until the excessively hot weather came on, when she gradually sank, and died on the 6th of July. No *post-mortem* was allowed.

The tumour removed in this case was solid and weighed $15\frac{3}{4}$ pounds. Dr. John L. Atlee, of Lancaster, my grandfather, and my father called it a *dermoid*. It was very irregular in shape and made up of a number of lobules easily separated; it contained a muco-fatty substance and some small pieces of calcareous matter. A section of the wall of the cyst made by my father showed structure similar to that of the skin, with rudiments of hairs and glands.

Dr. Formad also examined it and called it "a lipomatous fibroma undergoing mucoid degeneration."

ARTICLE IX.

THE TREATMENT OF EMPYEMA. By WM. C. DABNEY, M.D.,
of Charlottesville, Va.

No one can look over the literature of the subject without being struck with the difference of opinion which exists as to the best mode of treating purulent collections in the pleural cavity. Medicinal treatment without resort to surgical measures, aspiration, free incision *without* a drainage-tube, a single incision *with* the drainage-tube, through drainage and the use of various antiseptic injections have, at different times and by different writers, been warmly advocated.

I propose, in the present paper, to review these different modes of treatment, and shall endeavour to determine their relative value in different cases.

I shall report in the first place, however, three cases which have recently come under my observation and treatment, differing considerably from each other in various particulars, and requiring a different mode of treatment.

CASE I. was that of a gentleman sixty-one years old, of good family history, and whose previous health had been excellent. In the month of July, 1881, after considerable fatigue and exposure to a very high artificial temperature, he was taken with pneumonia as it was pronounced by the attending physician. I have not been able to learn any of the details of this attack, except that the patient, who was naturally quite thin, continued to lose flesh and strength, and to suffer from an exasperating cough for weeks. I did not see him till the early part of October, 1881, when he was brought to Charlottesville from his home in West Virginia by Dr.

R. B. Dice of this place, with whom I saw him on October 10th. At this time he was extremely emaciated; his cough was very troublesome, and he expectorated a very foul-smelling purulent matter. His temperature was about 103° in the afternoon, and his pulse 120. He had no appetite, but had been kept up by milk-punch and concentrated animal essences. The tympanitic percussion sound at the upper front part of the right side of the chest, together with flatness on percussion below and behind as he lay in bed, gave positive evidence of a collection of fluid in the pleural cavity, and a tenderness and slight bulging in the fifth intercostal space in front, was conclusive evidence to my mind that an empyema necessitatis was threatening; but in order to make the diagnosis certain, I passed a hollow needle into the pleural cavity, and drew off by the aspirator a small quantity of very thick and offensive pus; it was so thick, indeed, that it could with difficulty be got to flow through the needle, which was not the smallest size.

Before mentioning the treatment which was resorted to, I wish to mention a condition which existed both in this case and in one of the others which I shall report, but to which I have seen no allusion in any of the books or papers treating of empyema. This was a very thick eruption of sudamina *confined to the chest and limbs of the affected side*. It is, of course, well known that sudamina is apt to occur in the course of exhausting diseases, but it is not so clear why it should have occurred in these cases only on the side with the empyema.

On October 11th I made an incision into the pleural cavity at the place where it was pointing, and then passed through this a large-sized soft metal probe, which was pressed against the tissues in the seventh intercostal space, a little back of the axillary line. An incision was then made into the pleural cavity at this point, and the probe, to the bulbous end of which a drainage-tube had previously been attached, was drawn through, bringing the drainage-tube after it; the two ends of the tube were then tied together outside. The amount of pus discharged was perhaps six or eight ounces only, but it was very thick, greenish in colour, and exceedingly offensive. The pleural cavity was carefully and freely washed out with tepid water. No antiseptic precautions were used.

The next day the cavity was carefully washed out twice, and twice a day thereafter for a time with a two per cent. solution of carbolic acid, but after a few days symptoms of carbolic poisoning arose, and this had to be suspended, and pure water resorted to again. The discharge, however, was extremely offensive, and as several gangrenous pieces of lung tissue had escaped by the side of the drainage-tube, a one and a half per cent. solution of carbolic acid was again resorted to as an injection, but had again to be discontinued after a few days, on account of renewed symptoms of poisoning (pain in the region of the kidneys, olive-green urine, etc.). It was then determined to wash out the chest each day (*after* washing it with pure water) with a mixture of compound tincture of iodine and water, one part to three. This was found to answer an excellent purpose, though so long as the small gangrenous pieces continued to be discharged at intervals, the fetor kept up to some extent. A considerable quantity of purulent matter similar to that discharged by the thoracic openings was expectorated, and it was impossible for several weeks for the patient to lie on his left side on account of the cough it occasioned and the amount of purulent fluid which then ran into the bronchial tubes, and actually threatened suffocation.

Two weeks after making the first openings I found it necessary to make another at the lowest point of the pleural cavity in the scapular line, and the opening in the axillary line was allowed to heal. This was done, of course, to facilitate drainage, and it was also found better to insert a separate tube at each opening rather than to have a continuous tube passing through both. About the first of December both tubes were removed, and the front opening was allowed to heal. The tube was inserted daily, however, in the back opening till the middle of January, when the discharge being only about two drachms in the twenty-four hours, it too was allowed to heal, and there was no subsequent formation of pus.

Bedsore had formed when the patient first came under observation, and they gave much trouble, but improvement gradually took place, and at this date, July 18th, 1882, the patient's health is entirely restored.

CASE II. occurred in the person of a youth about sixteen years of age, named Overton, a pupil at the Miller Manual Labour School, in Albemarle County, Virginia. I could learn nothing of his family history, except that his father and mother both died in his infancy, from what cause could not be ascertained. I saw him first on April 25th, 1881, in consultation with Drs. J. D. Smith and John R. Wood, of Albemarle County, Virginia. His breathing was greatly interfered with; the chest gave dulness on percussion throughout, except at the upper back part, where it was tympanitic. The intercostal spaces were bulging. The heart's impulse was felt a little to the *right* of the *right* nipple. He had been sick about a month when I saw him; was greatly exhausted and emaciated; and it was impossible for him to lie down.

An aspirator needle was inserted by Dr. Wood, and six pints of odourless pus withdrawn. This gave some relief, but it was evident that comparatively little of the pus had been removed.

On April 29th I made a free incision into the pleural cavity in the scapular line, and a large quantity (over a gallon) of creamy pus was discharged. The discharge continued for eleven months, though it became much less abundant. Immediately after the operation, a drainage-tube was inserted, but in two or three days it slipped out, and was not replaced.

I did not see the patient from this time till March 6th, 1882, nearly a year after the chest was opened. His general health had then greatly improved; his appetite was fair, and he could walk half a mile at a time without much fatigue, but he had some fever almost every evening; his chest on the diseased side was greatly sunken, and there was a daily discharge of about one and a half pints of pus, there having been no diminution for several months. The canal was so tortuous that I could not insert a tube, and hence I cut down and enlarged the opening sufficiently to admit a No. 12 catheter, through which the cavity was freely washed out with pure water, and then with a mixture of compound tincture of iodine and water, one part to four.

This treatment was continued once a day for ten days, and then was necessarily omitted for a week on account of my own sickness. After the first week the catheter was withdrawn, and only inserted twice a day to draw off the pus which had collected. This course was rendered necessary by the special features of the case. The collapse of the walls of the chest had brought the ribs into very close proximity to each other, and, while immediately after the operation, it was possible to use a soft rubber catheter as a drainage-tube, this became impossible in a few days on ac-

count of the pressure of the granulations on the soft material of the tube, thus causing its closure. A gum catheter of smaller size, but firm enough to withstand the pressure, was then employed, but it was thought unadvisable to leave it in, for fear of injury to the lung.

As just stated, I was prevented from seeing the patient for a week, on account of my own sickness. During this time all treatment had been omitted, and when I saw him again the external wound had healed, and there was no evidence of any accumulation in the pleural cavity; his appetite was voracious, and he was gaining flesh and strength.

By April 1st he had gained thirteen pounds in weight, could walk a mile without fatigue, and looked well. When he lay on his back and then suddenly raised himself to a sitting posture, however, there was a very distinct sound and feeling as if some body—whether solid or fluid was hard to tell—was caused to strike against the anterior walls of the chest. In the absence of any physical evidence of an accumulation of fluid, I was inclined to attribute this to the change of position of the lung, which was compressed by false membranes.

The boy returned to his school early in April, able to do some work and to prosecute his studies. His chest had not expanded, to any appreciable extent, and the pectoral muscles on that side were very much wasted. To remedy this as far as practicable, I advised a system of gymnastics.

On the 3d of the present month (July, 1882) I heard, through the able and intelligent superintendent of the school, Capt. C. E. Vawter, that Overton had continued to gain in strength, and was at that time working in the field with the other boys. His chest, I learn, has expanded somewhat. I have not seen him myself since the early part of April last.

CASE III. The patient in this case was a boy fourteen years old, whose name was Dunn, and, singularly enough, he was a pupil at the Miller Manual Labour School, and his attack commenced about the same time with Overton's. The day that I operated on Overton first, April 29th, 1881, I saw Dunn, who at that time had a distinct accumulation in the pleural cavity; but as it was not very great, and had not been of very long duration, it was thought best not to tamper with it. It would doubtless have been better at that time to have inserted the needle of a hypodermic syringe, and determined the nature of the effusion.

I did not see this boy again till June 1st, 1882, when he was brought to this place for treatment. So far as I could learn his family history was good, and he himself, though not stout, had never had any serious sickness. Some time before he was brought to me an empyema necessitatis had formed; but I was told that before an external opening occurred he expectorated a great deal of purulent matter, which, however, was never offensive; since that time there had been very little cough or expectoration. When I saw him on June 1st there was flatness on percussion over the left side of the chest behind, and reaching as high up as the sixth rib, and dulness with bronchial breathing above this point. The right lung was healthy.

Through the opening into the chest, which was a little below and to the outside of the left nipple, about a pint of pus was discharged daily, and its discharge was greatly facilitated by making pressure on the right side of the chest.

There was probably some insufficiency of the mitral valves in this case; a systolic murmur heard most distinctly at the apex being very distinct.

The opening which then existed in the chest being much too small and

tortuous, and withal in a bad place to make thorough drainage or injections of any kind, I made a free incision into the pleural cavity between the sixth and seventh ribs, and directly below the lower angle of the scapula. There was quite a free discharge of pus, and the cavity was immediately washed out with tepid water. There was no febrile reaction. An ordinary gum catheter was inserted a very short distance into the pleural cavity, and then cut off, so that about half an inch projected out. This was kept in place by a safety pin and adhesive plaster. For the first three days there was a free discharge of odourless pus from the tube and the opening around it. The piece of catheter was removed daily, a soft rubber catheter inserted, and the cavity washed out thoroughly with simple water and then with compound tincture of iodine and water. After each washing the tube was replaced, to keep the wound open and facilitate drainage. On June 4th the tube was stopped up, and there had been no discharge. When the tube was removed a considerable quantity of offensive matter was discharged. The cavity was washed as before, the tube thoroughly cleansed and reinserted, but on the 5th there was again a stoppage, and a discharge of offensive pus when the tube was removed. On the 6th the same thing occurred, and I then inserted a soft rubber (Jacques) catheter with a number of holes cut in it about one and a half inch into the pleural cavity, and allowed it to project outwards about eight or ten inches. On the 7th I found the drainage had been performed very satisfactorily, and there was no fetor. On June 20th the tube was removed, and only inserted once a day to draw off the pus which had accumulated, and wash out the cavity. At this time only about a tablespoonful of pus was discharged daily, and as the opening in the chest on July 2d had contracted so much that the tube could not be inserted, the treatment was suspended, and the wound allowed to heal.

On July 13th, when I last heard from the patient, he was, to all appearances, perfectly well. His chest, which prior to the adoption of the radical method of treatment had been somewhat collapsed, had expanded considerably, and his strength had greatly improved.

During his stay in Charlottesville he had an attack of diarrhoea, which was quite troublesome, and no doubt retarded his recovery to some extent.

Whether his chest will refill again remains to be seen. Of course it is too early to judge definitely on this point.

I propose to consider the treatment of empyema under the following headings:—

1. The "medicinal" treatment of empyema, as it has been called, when no operative measures are resorted to.
2. The treatment by aspiration.
3. The treatment by free incision with and without the use of a drainage-tube.
4. The dangers of thoracentesis.
5. The use of injections in empyema.
6. The value of the antiseptic method in empyema.

1. *The Medicinal Treatment of Empyema, when no operative measures are resorted to.*—So long as twenty-five years ago, the rule laid down by Dr. (now Sir) Thomas Watson was to tap in all cases when the pleural effusion was purulent, and he justly urges an early resort to incision un-

der these circumstances. There are not wanting those, however, who, even in comparatively recent times, have expressed themselves as in favour of the expectant plan of treatment.

In 1876 Dr. Goodhart wrote: "It has long been known that an empyema may often be safely let alone,"¹ and he stated that he himself had notes of several cases in which he believed pus to have been present in the pleural cavity, and where the physical signs had gradually subsided under attention to the general health of the patient. He acknowledges, however, that these were probably not true empyemata, but rather local abscesses in the pleural cavity. There are three ways in which an empyema which is left to nature, so far as surgical interference is concerned, may result in recovery. (a) By absorption of pus; (b) by encapsulation of the pus or its resultant products; (c) by being freely discharged outwardly or through the lung.

(a) There can be no doubt that small accumulations of pus are occasionally absorbed, and there is some ground for the belief that even quite large ones are occasionally disposed of in this way. The following case, reported by Dr. Andrew Clark,² though it was once tapped, may fairly be placed in this category:—

The patient, a boy eight years old, with some albumen in his urine, "after being first treated with tincture of perchloride of iron, spirit of nitric ether, digitalis, and bitartrate of potash, and being allowed for a short time three ounces of gin daily, was, at the expiration of ten days, his breathing at that time being very laboured, tapped, and forty ounces of purulent fluid withdrawn from the pleural cavity. After this operation the breathing was much quieter, and the general condition of the patient improved. About the middle of June, two weeks after the paracentesis, the old symptoms returned with all the physical signs of a fresh accumulation of fluid on the right side of the chest. On July 1st a blister three inches square was applied over the seat of dulness. Under the repetition of this local treatment and the administration of digitalis, bicarbonate of potash, iodine, and steel, and subsequently of cod-liver oil, the patient gradually improved, the effusion disappeared, and the respiratory sounds returned on the right side of the chest. On December 2d the boy was discharged as cured."

While this fortunate result has been known to occur in a very small proportion of cases, it is, according to the almost unanimous testimony of writers, of such rare occurrence that it should be left out of consideration, so far as its practical bearings are concerned.

(b) The same may be said with respect to the encapsulation of pus or its derivatives. While it has been known to occur in a few cases, it may practically be left out of consideration. I shall endeavour to show hereafter the risk of trusting to the occurrence of this termination.

(c) "Another process by which a purulent effusion may result in recovery is when by necrosis of a small portion of the pulmonary pleura the pus infiltrates the lung-tissue, and so reaching the bronchi, is gradually discharged; but it is only rarely that recovery takes place in this way, and then after a tedious illness; much more commonly the lung-tissue becomes seriously diseased at the same time." Fräntzel.³

¹ Guy's Hospital Reports, 1876.

² Lancet, Jan. 1, 1870.

³ Ziemssen's Cyclopædia, vol. iv. p. 715.

It is highly probable that this occurred in my third case, that of Dunn. Prior to the bursting of the empyema outwardly, he expectorated a considerable quantity of purulent matter daily. Fräntzel remarks on the fact that when the pus escapes through the lung by a process of filtration, as it were, no fœtor is developed; while if it discharges directly and freely into a bronchus the discharge soon becomes fetid, and "a fatal termination may generally be looked for often after years of failing health." A similar result, he says, usually follows the discharge of the empyema "externally through the pleura costalis." Occasionally, however, recovery will take place after an external opening has formed in cases which seem almost desperate. The following illustrative example has been furnished me by Dr. George A. Wood, of Albemarle County, Va. :—

L. S. Sullivan was taken January 19th, 1879, with pleuro-pneumonia. The cough continued to be troublesome, and her fever did not abate for several weeks, during which time Dr. Wood saw her occasionally. In the latter part of the summer of 1879 a soft swelling made its appearance between the right scapula and the spinal column, and this gradually enlarged till it reached the size of a child's head. Her breathing was very laboured, and her condition seemed desperate. As the patient lived at some distance from Dr. Wood, and he could only see her occasionally, no record of her pulse and temperature was kept. On November 9th, 1879, Dr. W. was sent for by the girl's father, and on his arrival found that an opening had formed near the right nipple, extending into the pleural cavity on that side, through which "more than a common water-bucket full of pus had been discharged." The soft swelling on the back had disappeared. "The cavity continued to discharge for two months, and then healed, and the girl has remained well ever since," nearly three years having elapsed.

A somewhat similar case has been reported by Dr. Jacobs, of Cologne,¹ though in his case a drainage-tube was inserted through the opening.

In the great majority of cases, however, when empyema necessitatis occurs, the opening is too small to allow of free drainage, and the patient, after dragging on a miserable existence for months or years, finally dies of exhaustion.

It would be very interesting and instructive if we could obtain reliable statistics showing the result of different modes of treatment, but I have only been able to find such statistics reported by one writer on the subject. Dr. Ewald, of Berlin, has reported² forty-six cases of purulent pleural effusions treated in Frerich's clinic between the years 1860 and 1875. Including those cases in which empyema necessitatis occurred, 17 cases were treated medicinally, with 10 deaths (58.82 per cent.); 21 were freely opened, with 10 deaths (47.74 per cent.); 8 were aspirated, with 6 deaths (75 per cent.). We shall have occasion to refer hereafter to these mortality tables. Suffice it to say just here that Dr. Israel, of

¹ Deutsche Med. Wochenschrift, Aug. 5, 1876.

² Charité Annalen, 1876, p. 752 *et seq.*

Berlin, criticizes¹ Ewald's mode of operating when making a "free" incision, and states that his own results in similar cases have been much more favourable. It would be instructive also if we could learn the cause of death in each case, but Dr. Ewald is silent on this point, and we must look elsewhere for information. The risks incident to this mode of treatment may be thus summarized: (*a*) Sudden death, (*b*) exhaustion, (*c*) suffocation, (*d*) phthisis, (*e*) septicæmia, (*f*) calcareous degeneration of pus, (*g*) secondary pneumonia and gangrene of the lung, (*h*) bursting of the empyema into the peritoneal cavity, (*i*) amyloid degeneration of the liver, kidneys, etc.

(*a*) Sudden death is a risk incident to this mode of treatment of purulent as it is of serous pleurisy when the case is allowed to pursue its own course; though it is probable it would be more likely to occur in the latter, because the amount of effusion is usually greater in cases of this character. Death may be due under such circumstances to either acute oedema of the other lung, to syncope from twisting of the large blood-vessels,² or to thrombosis of some of the pulmonary vessels.

Fräntzel calls attention to the fact previously mentioned by Bartels, that when death is due to syncope the effusion is usually on the left side.

Leichtenstein, however, denies this,³ and states that sudden death is more common when the effusion is on the right side. As a proof of this he records fifty-two cases of sudden death in pleurisy, in thirty-one of which the right side was diseased.

To show the danger of delay when the pleural cavity is quite full of fluid, Fräntzel mentions a case which came under his own observation in which he deemed thoracentesis advisable, but the operation was postponed till the following day on account of the lateness of the hour. The patient died suddenly during the night. At the autopsy a large quantity of effusion was found in the left side, and "the lower part of the vena cava in the neighbourhood of the foramen quadrilateral was twisted almost at right angles." Such accidents as this would only be apt to occur when the effusion was very great.

Dr. Cayley has reported a case of death during injection of the pleural cavity, and in the course of his remarks on the case he referred to the fact that many cases were on record which showed that embolism might occur either after paracentesis or when no such operation had been performed, and he further stated that the liability to embolism was probably in direct proportion to the length of time the lung had been compressed by the effusion.⁴

There can be no reasonable doubt that sudden death is liable to occur

¹ Berlin Med. Gessel. Sitzung, vom May 1, 1876.

² Ziemssen's Cyclopedia, vol. iv. p. 680.

³ Deutsche Archiv für Klin. Med. Band. iv. 4. 4. 1876.

⁴ Lancet, Nov. 4th, 1876.

in the course of a pleurisy, whether serous or purulent, which has not been operated on; that it may be brought about by different pathological conditions, and that the liability to it is in a great degree proportional to the amount of the effusion and the length of time it has lasted.¹

(b) A second risk incident to the expectant mode of treating empyema is *exhaustion*. No writers on the subject, so far as I know, give any statistics bearing on this point, but all agree in the statement that this is the most common way in which the disease proves fatal when allowed to run its course without instrumental aid, though in cases where the empyema opens through the costal pleura and discharges outwardly the danger is, of course, less immediate, because the irritation caused by the accumulation of pus in a closed cavity, without means of exit, is avoided, but, as we have seen even in these cases, when the discharge through the costal pleura occurs, the ultimate prognosis is most unfavourable.

(c) Suffocation may occur in consequence of the bursting of an empyema into a bronchus, but the accident is a very rare one, and I can find no case recorded in the works to which I have access.

(d) But if the patient should escape the danger of exhaustion, and the pus should remain in the pleural cavity, no exit through the lungs or costal pleura having been formed, or the opening being insufficient to allow the free escape of the pus, it may become converted into a cheesy mass, and give rise to consequences of the most serious nature. It is true that when the pus does undergo such a change, it is usually surrounded by quite dense non-vascular membranes which may prevent danger; but, as a matter of fact, it is well known that these cases very frequently result in phthisis of the tubercular form. Fräntzel merely mentions the fact² that "caseous pneumonia in every variety of extent and course is the most frequent sequela of pleurisy;" but he does not state whether it is most common after the purulent or the serous form. The causation of tubercular phthisis, however, by the inoculation of caseous matter, first formally described by Villemin, has since been abundantly confirmed by the investigations of Fox, Burdon-Sanderson, Cohnheim, and others.³ Furthermore, it has been found that it is not necessary for caseation of the pus to occur in order that tubercle may be produced. The experimenters just mentioned found that other products of inflammation would have the same effect, and pus, which is apparently healthy, appears to cause such a result sometimes when retained in the pleural cavity or insufficiently discharged. The following case, reported to the Société Anatomique in June, 1876, was probably of this character:—

¹ Cf. *Le Progrès Médical*, 1876, pp. 482 and 526, and *Med. Times and Gazette*, Jan. 15th and Sept. 2d, 1876.

² *Op. cit.*, p. 674.

³ *Green's Pathology*, p. 221; *Cornil and Ranvier*, pp. 112 to 115; *Ziemssen's Encyclopædia*, vol. v.

In October, 1875, a young man, 19 years old, of previous good health and excellent family history, had a right pleurisy from which he apparently recovered. In December following he had smallpox, and in January the pleurisy reappeared on the same side. He was admitted into the Hôtel Dieu on April 26th, 1876, at which time his right pleural cavity was found filled with fluid, and empyema necessitatis was threatening. There was, in addition, a cavity at the apex of the other (left) lung. The patient died from exhaustion on May 26th. At the autopsy tubercles were found in both lungs and a small cavity in the apex of the left. The right kidney contained tubercular granulations, the left was healthy.¹

(e) Septicæmia or purulent infection occurs in a certain proportion of cases which are left to nature.

M. Brissaud reported to the Société Anatomique on May 3d, 1878, the case of a man 57 years old, who entered the Hospital Beaujon on March 4th with cancer of the stomach and a dry pleurisy at the base of the left lung. He had no fever, and, except that he became progressively emaciated, his condition was unchanged till March 23d, when there was a decided rise of temperature, and there was found to be effusion in the pleural cavity. The joints were swollen and painful, and purulent infection was diagnosed. The patient died on March 26th. The left pleural cavity contained a considerable quantity of pus and the articulations were filled with the same fluid.²

It is remarkable in this case how soon after the formation of the purulent effusion the infection occurred.

It might seem that infection would be especially liable to occur in those cases where the pus was discharged through the lung, on account of the readiness with which absorption occurs in that viscus; but, as a matter of fact, it is *less* frequent in these cases than in those where the purulent matter has *no* means of exit. From the very few cases which have been reported, it is probable that this mode of death is rare in purulent pleurisy.

(f) Calcareous degeneration can scarcely be considered a *risk* incident to the treatment of empyema medicinally, for ordinarily the chalky mass is encapsulated, and is, relatively speaking, a favourable termination of the disease. The calcareous matter may, however, be arranged in the form of plates on both the costal and pulmonary pleura, and keep up a continuous and exhausting irritation and discharge, as in the following case, reported to the Société Anatomique by Routier on January 28th, 1876:—

A man, 57 years of age, applied, January 8th, to be treated for a thoracic fistula which had formed some months before. The opening was in the lower part of the left side of the thoracic cavity, and gave exit to creamy pus in considerable quantity. A sound, directed backwards and outwards, penetrated eight centimetres, and then struck against a rough surface. The patient's general condition was extremely bad. The discharge of pus was not influenced by the respiratory movements. On the 23d of January the patient was suddenly taken with dyspnœa, which increased in intensity till his death from asphyxia during the night. At the autopsy the left pleural cavity was found to contain a considerable quantity of creamy pus; the costal and pulmonary pleuræ were both thickened, and in addition to this there were calcareous plates "all around" and on both surfaces. The sound, when introduced into the fistula, touched one of these plates, which terminated in a short, irregular border, and it was evidently this condition of things which had kept up the irritation and suppuration.³

¹ Le Progrès Médical, 1876, pp. 823-824.

² Ibid., 1878, pp. 581-582.

³ Ibid., 876, p. 372.

(g) Pneumonia does not seem to be a common result of empyema, except the caseous pneumonia to which reference has already been made when considering phthisis, and which is said by all writers to be a very common and very fatal sequel.

Gangrene of the lung is more often a cause than a result of empyema. This was probably the relation between the two in my first case, though it is not easy to say in this particular instance, and in the absence of a satisfactory history of the illness, which held the first place in point of time.

Besnier has reported¹ the case of a woman, 43 years of age, previously in good health, who, after a severe pleurisy of three weeks' duration, was tapped, and four hundred grammes of very fetid fluid were withdrawn. The woman died suddenly, a result which, he thought, was attributable to the irritation of the operation of thoracentesis, which caused a cardiac paralysis in the already exhausted patient. No autopsy was allowed, but Besnier considers the case one of primary gangrenous pleurisy, independent of any lesion of the lung tissue, and remarks on the fact that no previous case had been described. Another case was reported to the Société Méd. des Hôpitaux by Rendu, on the 23d of July, 1879, in *Le Progrès Médical*, March 6, 1880.

In an admirable paper² on "putrid pleurisy," by Fränkel, this case of Besnier is referred to, and the writer expresses very great doubt as to its being primary, and comes to the conclusion, as the result of careful and thorough investigation, that in almost all cases, if not in every case of putrid pleurisy, pulmonary gangrene is the efficient cause.

It is, of course, unnecessary for me to say that neither the pulmonary nor pleural gangrene is due to the mode of treatment of empyema now under consideration, but it is proper to refer to the subject just here, for the reason that the cause or complication of the purulent effusion would not be recognized when the medicinal treatment was pursued, and hence that mode of treatment which would give the best prospects of success would not be adopted. The subject will be considered more in detail hereafter.

(h) The discharge of an empyema into the peritoneal cavity is a possible, but apparently a very infrequent occurrence. It is alluded to by writers on the subject, but I find very few cases recorded.

(i) Amyloid degeneration of the liver, kidneys, and other organs, is liable to follow prolonged suppuration from any tissue or place, though suppuration of bones is, as is well known, much more apt to lead to such a result than a similar discharge from other tissues or organs.³

This danger is not incident to the medicinal treatment of empyema only, but may occur after any mode of treatment when the discharge of pus is permitted to continue.

¹ L'Union Médicale, June 29, 1875.

² Berliner Klin. Wochenschr., No. 17 and 18, 1879.

³ Cornil and Ranvier, Patholog. Histology, p. 46; Rindfleisch, Pathol. Histology, p. 57; Schuppel, Ziemssen's Cyclopædia, vol. ix. p. 412; Bartels, in Ziemssen's Cyclopædia, vol. xv. p. 498; Billroth, Surgical Pathol., p. 428, etc. etc.

In September, 1879, Dr. F. Taylor reported to the Clinical Society of London a case of empyema, in which amyloid degeneration of several organs was found at the autopsy.

The patient was a child, 6 years old, who, after suffering with pleurisy for more than five months, had the chest incised on April 16, 1877. About ten ounces of pus were discharged. Tubes were inserted, and the chest washed out daily. On May 20th a counter-opening was made, but these openings closed so rapidly that the pus was retained, and by the end of June very little progress had been made. On July 2d, portions of the 7th, 8th, and 9th ribs were removed; each portion was about an inch and a half long. Through the large opening thus made two drainage-tubes were inserted, and there was immediate and decided improvement; but in a short time the wound filled up so as to leave only a narrow sinus, and the pus was very insufficiently discharged and continued to form freely. The child lived till October, 1878. At the autopsy the empyema was found to occupy chiefly the posterior part of the chest, reaching from base to apex; there was no tubercle; the liver, kidneys, and intestines were lardaceous, and there was recent acute peritonitis.¹

2. *The Treatment of Empyema by Aspiration.*—The text-books (so far as I have access to them), with scarcely an exception, state that however efficacious aspiration may be in serous effusions, it is useless in nearly all cases of empyema if the patient be an adult. More than one writer on the subject, however, states that in the case of children the disease may sometimes be cured by aspiration, and Fonson has reported² nineteen cases of purulent pleurisy in children treated in this way with most satisfactory results. It appears from his statistics that the younger the patient the greater the probability of success.

The cause of the far better results obtained by aspirating for empyema in children than in adults is to be found in the following circumstances: (1) the elasticity of the thoracic walls is greater in young subjects than in older ones; (2) the thoracic organs themselves expand more readily after being subjected to pressure in children than in older persons; (3) the vital forces are much more active in children. He urges that the aspiration shall be as complete as possible; indeed, the effort should be to empty the thoracic cavity of all its purulent contents. If this be done, there is far less danger of secondary troubles, and the cure progresses more rapidly; only when the purulent effusion is putrid does he consider the radical operation advisable.

Dr. Gerhardt,³ of Würzburg, read a paper on empyema in children before the section on diseases of children of the London International Congress last year. The conclusions at which he arrived are of interest, and I shall state them in full here, though they do not, of course, relate solely to aspiration. He says:—

An empyema of slight extent may be cured either by absorption or by perforation of the lung. Operative interference is absolutely necessary when the circulatory or pulmonary troubles threaten life, or when all other means have failed. Complete aspiration of the purulent fluid may lead to a cure. The incisions into

¹ Med. Times and Gazette, Oct. 18, 1879.

² Th. inaug., Paris, 1877.

³ Le Progrès Médical, June 17, 1882.

the pleural cavity with subsequent antiseptic injections are neither free from danger nor are they always effectual. The best mode of treatment consists in opening the pleural cavity with full antiseptic precautions, and washing out the thorax "out of contact with the air." The results obtained in *early* infancy are less favourable than in adults; at a later period of childhood they are more favourable.

A paper on the same subject was read before the Congress by M. Baginski, whose conclusions were as follows:—

(1) Pleuritic effusions are more frequent in infancy than in adult age. (2) A positive diagnosis can only be made by making an exploratory puncture. (3) The evacuation of the pus by the lung is not inconsistent with a complete cure. (4) The indications for surgical interference are the continuance of fever, incessant and exhausting cough, and loss of appetite and emaciation. (5) Aspiration with antiseptic precautions often suffices to obtain a cure; the puncture should be made at the lowest part of the pleural cavity, and it is best to draw off only a part of the pus. (6) If, after two or three aspirations, the fever returns, or if there is an increase in the quantity of the effusion, or if the patient loses strength, it becomes necessary to make a free incision into the pleura with the most complete antiseptic precautions possible. The cavity may be washed out with a 3 per cent. solution of salicylic acid, an elastic drainage-tube should be inserted, and the antiseptic dressing applied. It is usually unnecessary to resect a portion of the ribs. After the operation the thoracic cavity should be washed as often as may be thought advisable.

Baginski is not in accord with other advocates of aspiration for empyema in one respect, namely, in thinking that only a part of the pus should be withdrawn. The dangers of such a course have already been considered.

Dr. Lewis Smith, however, thinks that when only a small quantity of pus is retained it is not apt to cause trouble.

"In general," he says, "I prefer the use of the aspirator for the removal of pus in the empyema of children. The removal of all the pus which can be aspirated at a single sitting through an aspirator point of medium size will ordinarily, I think, be sufficient to insure a favourable result; for though there is some pus remaining it will be absorbed, provided that the quantity is not too large. If the child do not progressively improve, or if the physical signs indicate a refilling of the cavity with pus, I would then establish a fistulous opening."¹

Accidents from the use of the aspirator are rare, but a few undoubted cases have been reported. Quite a number of cases have been recorded in which a serous pleurisy has been converted into a purulent one by aspiration, but with that we have nothing to do in this paper.

M. Bucquoy,² however, reported to the Académie de Médecine on Nov. 25, 1879, two cases in which "pneumothorax consecutive to thoracentesis by aspiration occurred without communication of the pleura with the external air." The first case terminated fatally; the patient had suffered with empyema for a long time and in addition was tuberculous. At the autopsy no perforation of the lung could be found. The second case terminated in recovery, which did not appear to be interrupted or retarded by the pneumothorax. Two other cases occurring in the practice of other physicians were also referred to, and M. Bucquoy says that he thinks the cases

¹ Diseases of Children, p. 570.

² Le Progrès Medical, 1879, p. 941.

worthy of record, though, in spite of the alarm which such an occurrence causes the physician, it does not appear to be attended with evil consequences in the majority of cases, and cannot be considered as contraindicating the operation when other circumstances appear to make it necessary.

This is probably the best place to describe the method of treatment recommended and pursued by Dr. Kashimura,¹ of Tokio, Japan, which is a modified form of aspiration.

This treatment, which is extremely simple, consists in withdrawing the pus by means of an aspirator and then washing out the cavity with a solution of thymol till the solution returns clear. The needle is then withdrawn and the operation is finished. Dr. Goltdammer, of the Bethany Hospital, Berlin, heartily endorses this treatment,² and states that the results have been extremely favourable, though he himself only reports one case. A woman, 41 years of age, in a state of great prostration with an empyema of a month's standing, was aspirated, and seven or eight hundred cubic centimetres of pus withdrawn; the thoracic cavity was then washed out with thymol water and the needle withdrawn. Eight days afterwards all traces of effusion had disappeared, and there was no return of it later on. The result in this and similar cases is attributed by Dr. Goltdammer to the use of antiseptics; but this is certainly open to doubt, quite a number of cases having been reported in which a single aspiration or even puncture with a trocar was followed by a cure. In one of my cases, that of Overton, the external opening, which was large, closed while there was still a considerable discharge of pus, and yet there was not only no further trouble at that time, but he continued to gain flesh and strength, and his chest has expanded considerably. Compound tincture of iodine had, it is true, been employed several times in this case, but none of the recognized antiseptics had been used.

So few cases have been recorded in which this mode of treatment was employed that it is scarcely possible to form a just estimate of its value. It seems highly improbable, however, that it could prove efficacious in pleurisy when the discharge was fetid.

3. *The Treatment by Free Incision with and without the Use of a Drainage-tube.*—Nearly all recent writers are in accord as to the propriety of making a free incision in most cases of empyema in the adult, but considerable difference of opinion exists as to the advisability of using the drainage-tube. The objection of those who oppose this method of treatment is based on the opinion that the drainage-tube is liable to cause or to keep up irritation in the pleural cavity or even in the lung itself, and furthermore that there is a risk of the tube being broken and a part remaining in the thoracic cavity. Two of the leading physicians in this

¹ Berliner Klin. Wochenschrift, No. 3, 1880.

² Ibid., Nos. 19 and 20, 1880.

country in their respective branches of the healing art—Drs. Gross, Sr., and Flint, Sr.—have expressed themselves adversely to the tube for the reasons which have just been stated.

Gross says: "The use of the drainage-tube has lately been recommended but the treatment it seems to me should not be encouraged, as it is both harsh and dangerous."¹ It will be observed that he does not mention the source of danger, but it is to be presumed that it is irritation of the pleural cavity and lung.

Flint is more explicit. After advising that aspiration with removal of all the pus be first tried, and stating that in a very small proportion of cases a cure is effected in this way, he says:—

"If the pus reaccumulate a free opening should be made at the bottom of the chest, this opening is to be made fistulous by tents; this is preferable to the introduction of a drainage-tube, which excites irritation and is liable to be broken, a portion remaining within the chest, an accident which has occurred within the author's knowledge."²

Erichsen says: "If the accumulation be an empyema the canula or an elastic tube may be left in the chest and the pus drawn off or removed as it accumulates; or a gum catheter or drainage-tube may be left in and the pus allowed to drain off as fast as secreted."³ He remarks further that Goodfellow and Dr. Morgan have advantageously "adopted the use of drainage-tubes in empyema with a view of preventing the accumulation of pus, its fetid decomposition and consequent irritative fever, and of allowing the gradual expansion of the previously compressed lung or collapse of the chest wall."

Bryant says the introduction of drainage-tubes into practice has been of great benefit in the treatment of empyema.⁴

Aitken is in favour of through drainage, considering it more efficacious than the formation of a single opening even when a drainage-tube is inserted into it.⁵

Anstie after advising a trial of aspiration, says that in most cases after making a free opening:—

"It will be necessary to keep the canula in, cork it up and daily allow the exit of pus and then wash out the cavity. But in my opinion if it comes to this the better plan by far is the drainage-tube,"⁶ and in describing the best way of using this he advises the method of through drainage.

Of American writers Ashhurst favours the use of the drainage-tube and through drainage.⁷ Dr. T. M. Markoe, in a paper read before the New York Pathological Society, Oct. 13, 1880, reports a case in which through drainage was practised,⁸ the discharge at the time of operation was extremely fetid, but when the patient was last heard from three months after the operation only a few drops of pus were discharged daily. Dr. Markoe made his openings some distance apart, and one of them at the lowest part of the purulent collection.

¹ System of Surgery, vol. ii. p. 455.

² Clinical Medicine, p. 112.

³ System of Surgery, p. 920.

⁴ Surgery, p. 546.

⁵ Practice of Medicine, vol. ii. p. 589.

⁶ Reynolds's System of Medicine, vol. ii. p. 357.

⁷ Surgery, p. 362.

⁸ Medical Record, Nov. 13, 1880.

An intractable case of empyema cured by making through drainage after one free opening had failed, was reported to the "Society of German Physicians" of New York, by Dr. Hineman, on Nov. 26, 1880.¹ The boy, aged 4 years, had grown steadily worse after the first incision was made until it was supplemented by a second one. In the discussion which ensued Dr. Gerster stated that he thought the favourable results in many cases of empyema treated by operation were due to the use of antiseptics. Dr. Jacobi thought the use of any particular method of operation would and should depend on the nature of the individual case, and he warned against the practice of costal resections in children.

Fritz² states that a free incision is advisable in putrid empyema and in those cases where it occurs after pneumonia, while if the disease be primary he advises aspiration. Contrary to the usual opinion he considers the latter class of cases the most dangerous (possibly from the mode of treatment adopted). Drainage was employed in all of my own cases, but in only one did through drainage seem indicated. In this the pus was extremely fetid, and there was good ground to believe that the empyema was due to or at least an accompaniment of gangrene of the lung.

The weight of authority, as we have seen, is in favour of drainage in some form; and this seems to me the rational practice. Aspiration, however, occasionally gives good results even in adults, and even repeated punctures with a trocar and canula, may lead to a favourable termination in cases which are most unpromising, as in the following:—

"Private Martin Carbit, Co. B. 18th U. S. Infantry, aged 23 years, was admitted to hospital at Camp Dennison June 24th, 1864, suffering from empyema of the left side. The symptoms present were an entire absence of respiratory murmur on the affected side, bronchial respiration and protrusion of the intercostal spaces; . . . there was also a small opening between the second and third costal cartilages at their junction with the sternum. On August 26th the patient was very weak, and life was fast ebbing away. His appetite was poor, and he suffered from diarrhœa, fever, and great dyspnœa. Acting Assistant Surgeon A. Buckingham introduced a canula between the sixth and seventh ribs; about one quart of thick pus of very offensive odour flowed away. The operation was repeated on August 28th and 30th, and on September 1st, 3d, and 5th, the same quantity being drawn off each time, the pus becoming thinner. The side collapsed considerably and the patient's strength improved rapidly. He was discharged from service September 6th, 1864." (Probably some mistake about the date.) "Not a pensioner."³

Three other cases of idiopathic empyema are reported at the same place. Of these, two recovered and one died. All were submitted to thoracotomy, and in the two cases which terminated favourably the empyema was the result of metastatic abscesses in the lung.

With respect to the use of the drainage-tube experience does not bear out the apprehensions which have been alluded to, that the drainage-tube would prove irritating except as we shall see hereafter when the discharge

¹ Med. Record, Jan. 1, 1881.

² Zeitschr. für Klin. Med., iii. Band, 1 Heft.

³ Med. and Surg. History of War of the Rebellion, 1st Surg. Vol. p. 573.

has become very slight; and with reasonable care it is very unlikely that the tube would become broken so as to leave a piece in the pleural cavity.

It seems to me that *continuous* drainage in some form is vastly preferable in the great majority of cases, and Israel, while criticizing the treatment pursued by Ewald, expresses himself strongly in favour of this mode. Of eleven uncomplicated cases treated by Israel's method, which consists essentially in through and continuous drainage, ten recovered without a fistula.¹

Dr. Leonpacher also narrates² several interesting cases, which were treated by him in which continuous drainage was found to be essential, and says the essential points to be observed in the treatment of cases of thoracentesis for empyema are, (1) the complete removal of the purulent secretion from the pleural cavity, (2) a continuous outflow of pus as it forms, (3) the total exclusion of all septic matter from the wound, and the arrest of the septic process if it has already commenced.

When the pus is free from odour, a single opening seems ordinarily to be sufficient, a drainage-tube being kept constantly in it, and care being taken to prevent the tube from becoming stopped. On several occasions I have seen the discharge become offensive when the tube was closed, and promptly become sweet again when the tube was opened. The continuous discharge of pus is far better than its daily removal, not only because it seems less liable according to my experience to become fetid, but because as the two surfaces of the pleura have to come together and heal by granulations the retention of pus would delay this process by keeping the costal and pulmonary surfaces apart.

Through drainage would be advisable in those cases where the contents of the pleural cavity were very offensive, or where simple drainage with a single free incision had proved ineffectual. The only advantage of through drainage over a single opening is that the free access of air to the pleural cavity through the upper or front opening facilitates the discharge of pus through the other.

On this account one of the openings should be at the lowest part of the pleural cavity and the other at a higher level. In my first case I found it necessary, though through drainage had already been established, to make another opening lower down. Dr. Markoe also calls attention to this point in the paper already referred to.

With respect to the different modes of practising drainage not much need be said. The simplest method, that by a drainage-tube hanging free outside, and kept in place by a safety pin and adhesive plaster, has undoubtedly given as good if not better results than any of the more complicated processes.

¹ Berliner Med. Gessell. Sitzung vom Mai 1st, 1876.

² Aertztliches Intelligenz-blatt, April 2, 1878.

M. Potain has proposed what he terms the treatment by the double siphon, and he exhibited a patient at a meeting of the Société Médicale des Hôpitaux treated in this way.¹ The plan consists in inserting two tubes a short distance apart through an intercostal space, and then connecting one with a vessel containing some disinfectant fluid, and the other with a receptacle placed under or by the bed. The disinfectant fluid runs thus through the thoracic cavity when the vessel is raised and out through the other tube into the receptacle. M. Potain claims good results from this treatment. Dr. Playfair formerly advised, and practised with success, subaqueous drainage as he termed it; one end of a tube was inserted into the chest in such a way as to prevent the entrance of air and the other end was immersed in water. In the three cases which he mentions the apparatus was kept in operation 21 days, 13 days, and 7 days respectively, the results being satisfactory in every instance.² In a subsequent paper³ he remarks on the practical difficulties of this method, and declares himself in favour of the drainage-tube with full antiseptic precautions.

Fräntzel's method does not permit continuous drainage to be carried on, and is, on that account, objectionable. He inserts a silver canula, broad enough to admit two soft catheters, into the thoracic opening, and keeps this canula carefully closed and protected with antiseptic gauze dressings, except twice a day when the dressings are removed, the catheters inserted, and the pleural cavity emptied of pus and then washed out—all of which is done under the spray.

Before leaving this subject of drainage I wish to refer very briefly to this mode of treatment in some cases of gangrene of the lung. This affection, though one of the causes of empyema, does not properly come within the limits of the present paper, yet the matter seems to me to be worthy of serious consideration. Portions of gangrenous lung tissue were discharged through the thoracic openings several times in one of my cases, and at least two other similar cases have been described which terminated in recovery.

The first of these was reported to the Société Médicale des Hôpitaux by Milard,⁴ the patient being Prof. Dolbeau. Aspiration was first tried by Dieulafoy with benefit. On April 20th Nélaton made an exploratory puncture with a trocar and canula in the seventh intercostal space and in the axillary line, and 2450 grammes of fetid pus were discharged; a drainage-tube was inserted and the cavity washed out with thymol water. There was temporary improvement, but his general condition soon became very bad, and on May 4th Nélaton made a free incision into the pleural cavity through which was discharged a considerable quantity of very offensive pus and pieces of gangrenous lung tissue. After this time improvement went on rapidly and by the end of May the patient had completely recovered, and singularly enough that side of the chest was very little sunken.

¹ Le Progrès Médical, Nov. 12th, 1877.

² Transactions Obstet. Society of London, 1872.

³ Obstet. Journal of Great Britain, Jan. 15th, 1880.

⁴ Gazette Hebdomadaire, No. 43, 1875.

The second case is reported by Fränkel.¹

The patient was a girl, 12 years old, who had a pleuro-pneumonia in the lower part of the right lung. She did well till the seventh day, when severe pain in the affected side and dyspnoea came on. Fourteen days after this the patient suddenly coughed up a considerable quantity of dirty, purulent, and exceedingly offensive fluid. On this account Fränkel was satisfied that she had a putrid pleurisy "in consequence of gangrene of the lung." Puncture of the chest showed that it contained foul pus, and the radical operation for empyema was performed. Two months later the patient was well.

These cases suggest the question, Whether in cases of pulmonary gangrene, even when there was no sign of pleuritic effusion, it would not be well to pass a small aspirating needle into the pleural cavity on the side of the diseased lung, and ascertain if it contained fetid fluid or *gas*, and if it did to make at once a free opening into the pleural cavity on that side, so that through drainage could be established and appropriate remedies employed? This course seems to me a proper one, and should occasion arise I should not hesitate to try it.

The point at which to make the incision in the radical operation is a matter about which there is considerable difference of opinion. Most American writers advise that it be made below the angle of the scapula, and between the sixth and seventh ribs. Fräntzel thinks it best to cut further around in the neighbourhood of the nipple. Wagner recommends that it be made in the fifth or sixth intercostal space and at the outer margin of the latissimus dorsi.² If a single incision be made drainage will take place better, and the cavity will be more thoroughly evacuated if the cut be made in the back or in Wagner's position; and if two incisions are made, one of them should be at this point.

Resection of the ribs has been proposed and practised in repeated instances. It is only necessary when the ribs are too close together to admit a drainage-tube, and should be avoided, if possible, especially in children (Jacobi); when necessary, the method pursued by Winiwarer,³ of resecting a part of the upper edge of the rib only, would seem to be decidedly preferable to dividing the bone entirely.

Another question of practical importance is as to the time when the tube should be removed and the opening allowed to heal. It is not easy to lay down any definite rules on this point. It would probably be best to wait till the discharge had almost ceased before removing the tube, though in one of my cases, and in a number of others which have been reported, the discharge was still considerable when the opening closed and no evil results followed. In some cases, however, the pleural cavity has refilled and its contents become fetid. It would, of course, be injudicious to allow the thoracic opening to close so long as the discharge was fetid,

¹ Berliner Klin. Wochenschrift, Nos. 17 and 18, 1879.

² Volkmanns Samml. Klin. Vorträge, No. 197.

³ K. K. Gessellsch. der Aerzte, Sitzung, April 27, 1877.

but the fact that it is still purulent does not seem to necessitate a continuance of the treatment. When not more than two drachms of sweet pus are discharged daily it would be safe I think to allow the wound to close. Certainly the drainage-tube should then be withdrawn and only inserted once a day (or even at longer intervals) so long as the opening in the chest would permit, to draw off any pus which might have accumulated. The presence of the tube itself would almost certainly keep up a slight discharge.

4. *The Dangers of Thoracentesis and of Injecting the Pleural Cavity.*—That the simple operation of thoracentesis is occasionally followed by alarming or even fatal results there is no reasonable ground for doubt. The time, however, at which dangerous symptoms appear, and the pathological conditions attending them are different in different cases. In two, at least, of the fatal cases (Besnier's and Raynaud's¹) death occurred at the very moment that the chest was punctured, and was apparently due to syncope. Of two other cases reported to the Société de Biologie by Dumontpalier, Oct. 16, 1880,² both had been repeatedly injected without any trouble. In one of these, however, on one occasion only a few drops had been injected when alarming syncope occurred. In the other case, under similar circumstances, there was general contraction of the muscles in the opposite side, which was followed by paresis.

M. Sevestre, after a careful review³ of the cases of sudden death and also those in which alarming symptoms had occurred, but which ended in recovery, which had happened prior to June, 1876, thus concludes:—

“After an examination of the reported cases it appears that sudden death coming on during or after thoracentesis is to be attributed in some cases to syncope, the mechanism of which varies according to circumstances. In certain cases it appears to be reflex and due to the pain or to the moral impression accompanying the puncture in a debilitated person. In other instances the syncope is probably brought about by an anæmia of the bulb at the moment when the patient attempts to rise. In all cases, however, the syncope is probably favoured by an alteration in the condition of the muscular fibres of the heart, and perhaps also by a certain degree of pulmonary congestion.”

Then turning to the practical side of the matter he says:—

“Death may occur either suddenly or after some hours or days, but it is of such exceptional occurrence when compared with the number of times that thoracentesis is performed that it cannot reasonably be considered a contra-indication to the operation. Proper precautions, however, should always be taken, especially in debilitated or very impressionable individuals, the pain which is ordinarily insignificant should be avoided as much as possible, and in order to accomplish this a small trocar should be used; the fluid should also be withdrawn slowly so as to avoid the sudden afflux of blood to the lungs. Finally, the patient should be cautioned to lie quiet after the operation.”

In a very able review of this same subject in the *Medical Times and Gazette* of January 15, 1876, the following reasons are given for consider-

¹ Le Progrès Médical, 1876, pp. 482, 526.

² Ibid., Oct. 20, 1880.

³ Ibid., June 24, and July 15, 1876.

ing it at least doubtful whether death in these rare cases is always attributable to the operation or the subsequent injection:—

“(1) Sudden death has occurred in simple pleurisy as well as during other diseases, such as typhoid fever and cancer; (2) There has been no uniformity in the stage after thoracentesis at which sudden death has occurred; (3) There has been no uniformity in the mode of death, nor in the pathological conditions found after death.”

Dr. Cayley, to whose paper reference has already been made, calls attention to certain points of practical importance not mentioned by the other writers who have been quoted. One of these points is that the nature of the fluid, when injections have been used, seems to be unimportant, and the second and more important point is that in every case of which he had any knowledge, the convulsions or other alarming symptoms come on while the fluid was being injected, not while it was being withdrawn.

5. *The Use of Injections in Empyema.*—Anstie thought that in a large majority of cases the only thing necessary was to wash out the cavity of the chest with simple tepid water, and he only advised the use of tincture of iodine in cases where the discharge was fetid. He mentions that the use of tincture of iodine and water (1 part to 4) had never to his knowledge given rise to any unpleasant symptoms nor has any case been reported since, so far as I can learn; the fatal result in Cayley's case when iodine was used being fairly attributed to other causes, or to say the least it could not fairly be attributed to the injection of iodine. In two of my cases I washed out the pleural cavity daily, first with simple water, and then with a mixture of compound tincture of iodine and water (from 15 to 40 per cent. of the former). Apparently the most important thing is to keep the drainage-tube clean and free from obstructions, and this can be done as well with pure water as with anything else. Fräntzel says that a few days after the operation simple water should be replaced by a solution of common salt $2\frac{1}{2}$ grains to the ounce. Should this prove insufficient compound tincture of iodine, or a solution of permanganate of potash 1 grain to the ounce, or of carbolic acid 2 grains to the ounce, will, he thinks, prove serviceable.

As might be expected carbolic acid has been highly extolled, but its use is not free from danger, and other agents will probably act as well even when the pus is fetid. In my first case symptoms of carbolic poisoning occurred when a 2 per cent. solution was injected and every precaution taken to insure its prompt return, and iodine was then substituted for it with entirely satisfactory results. Dr. Markoe states¹ that he “would not be willing to inject a large empyemic cavity with carbolic solution for fear of accident.” Other cases of abscesses, similar in many respects to the pleural cavity in empyema, in which serious or fatal consequences ensued on injecting them with carbolic acid, were mentioned by Dr. Stimson and others.

¹ Loc cit.

If carbolic acid be employed the utmost care should be taken to see that it is freely discharged. Dr. Lucas-Championnière, whose partiality for antiseptics in general and carbolic acid in particular is well known, says, when speaking of their use in empyema:—

“I think that in many cases we may dispense with injections of the cavity, at least for a long time, and yet one is generally led to make them. My advice in such cases is to distrust carbolic solutions, which are very rapidly absorbed by the pleura, and to use instead injections of boracic acid water or even a weak solution of chloride of zinc.”

König, of Göttingen, strongly recommends carbolic acid injections in the strength of $2\frac{1}{2}$ or 5 per cent., and quotes Hueter to the effect that solutions of this strength are less liable to cause poisoning than weaker ones, inasmuch as they cause coagulation. König first used a solution of salicylic acid, and, when that returns clear, he follows it by carbolic acid. It is to be inferred, however, that this plan is only pursued at the first washing, when there are probably more false membranous deposits, and, consequently, less danger of absorption than subsequently. When the pus is pure and free from odour, he thinks the salicylic acid will be sufficient. He acknowledges that there is some risk of carbolic poisoning, “but the danger to the patient will be less than that of septicæmia.” Kuster, in a paper on carbolic poisoning,¹ states that his experiments show that anæmia and septic and pyæmic fevers predispose the system to carbolic acid intoxication, and he advises that large cavities be washed out with an 8 per cent. solution of chloride of zinc in preference to carbolic acid.

The late Dr. Erskine Mason stated at a meeting of the New York Surgical Society on October 13th, 1880, that he had repeatedly washed out the chest in cases of empyema, when the discharge was offensive, with a 1 per cent. solution of salicylic acid without the slightest bad consequences, and with the effect of immediately deodorizing the discharge. Berthold recommends the same drug in pulmonary gangrene.²

Lucas-Championnière, as we have seen, advises injections of boracic acid; but in at least three cases, two of which were empyema, serious consequences have resulted from injecting a pus cavity with this agent. In two of these cases, it is true, the charge of reckless use might be sustained without difficulty, but it should be remembered that boracic acid has usually been considered a perfectly harmless but not very efficient antiseptic. The first two cases which terminated fatally are reported³ by Malodenkow, of Moscow.

In the first case a 5 per cent. solution of boracic acid was used to wash out the pleural cavity of a patient 25 years of age, the operation lasting an hour, and thirty pounds of the solution being employed. Nausea and vomiting followed; the pulse became frequent and the patient prostrate. On the following evening

¹ Langenbeck's Archiv, vol. xxiii.

² Rundschau, 1876, p. 427.

³ Lancet, May 6th, 1882, and Med. News, May 27th, 1882.

erythema appeared on the face, and spread on the third day to the neck, chest, and abdomen. On the third day the erythema had extended to the thighs, and small vesicles appeared on the face and in the throat; sight became dim, and the patient died, consciousness being preserved to the last.

The second patient was 16 years of age, and suffered from a lumbar abscess, which was opened and washed out with the same solution and for the same length of time. The operation was followed by symptoms precisely similar to those observed in the first case, and the patient died on the third day with indications of cardiac paralysis.

The third case is reported by Dr. Ralph C. Huse, of Georgetown, Mass.¹

The patient was a boy aged 3 years, with a pyothorax of four months' duration; "the left pleural cavity having been washed out with a saturated solution of this acid, the chest was thoroughly evacuated as I supposed. Sixteen ounces of the solution were used, and the patient was left as comfortable as usual, previous injections of Lugol's solution properly diluted having been used; but at this time I substituted boracic acid as a more innocuous antiseptic. In the evening I was notified that a rash had broken out on the patient, and was requested to visit him. I found him covered with a very severe erythema, accompanied by a very rapid and extremely soft pulse, suggestive of collapse, so that I prescribed acetate of ammonia and warm baths. The next morning I repeated the acid injection, with an aggravation of the symptoms which had been ameliorated by the stimulants during the evening, this last injection being accompanied by extreme nausea and vomiting." The patient rallied and recovered in six weeks under injections of permanganate of potash.

No case has been recorded, so far as I can learn, in which unpleasant symptoms have arisen from the use of this latter drug, and in cases of offensive discharge it would seem from the reports of those that have used it to be very efficacious.

Thymol water has been used in a number of cases. The composition given by Lewin² is 2 or 3 parts per 1000 of water. In Goltdammer's case, in which the chest was washed out by means of the aspirator, two litres of thymol water were used. It is not likely that enough of this would be absorbed by the pleura to cause unpleasant symptoms, though 45 grains given by the mouth have occasioned alarming symptoms.³

Lucas-Champonnière states that thymic acid is a very unreliable antiseptic and a decided irritant.⁴

6. *The Value of the Antiseptic Method in Empyema.*—At a time when antiseptics were occupying so large a part of the attention of medical men, it was not surprising that we find the writers of three or four years ago laying great stress on the necessity, or, at least, the advisability, of using Listerism in all its details during the radical operation for empyema. Accordingly we find Fräntzel,⁵ König,⁶ Playfair,⁷ Gerster,⁸ Winiwarter,⁹ and, indeed, the great majority of recent writers, laying great stress on

¹ Medical News, June 24th, 1882.

² Centralblatt für die Med. Wissenschaften, Mai 1st, 1875.

³ Bael, Archiv für Heilkunde, Band xiv, 3 and 4.

⁴ Op. cit. p. 227.

⁵ Op cit.

⁶ Medical Examiner, July 25, 1878.

⁷ Obstet. Journal of Great Britain, Jan. 15, 1880.

⁸ Med. Record, Jan. 1, 1881.

⁹ Rundschau, 1877, p. 462.

the importance of complete antiseptic precautions. Such precautions would probably be advisable or even necessary to insure good results in a crowded city or hospital, but there is some doubt, at least, whether they would be of much value in the country. My own observations are too few in number to enable one to form a definite opinion, but in all of them and in one other case recently operated on by Dr. J. W. Williams of this county, there was entire success without the use of any antiseptic measures; and just here it may be mentioned that the mortality after amputations and other surgical operations in this section of country is very slight, though, so far as I know, antiseptic dressings are rarely employed and the spray is never used. In view of the fact, however, that Listerism is advised by so many surgeons in cases of empyema, it would probably be best to employ it in city or hospital practice at least, provided that it did not interfere in any way with continuous drainage.

The conclusions which seem to me to be warranted with respect to the treatment of empyema are as follows:—

1. “Medicinal” treatment, as it has been called, namely, treatment without operation, occasionally gives favourable results, but is not advisable, inasmuch as cases so treated are liable to terminate in one or other of the following ways: (*a*) Sudden death, (*b*) exhaustion, (*c*) suffocation, (*d*) phthisis, (*e*) septicæmia, (*f*) calcareous degeneration of the pus, (*g*) secondary pneumonia and gangrene of the lung, (*h*) peritonitis from the bursting of the empyema into the peritoneal cavity, (*i*) amyloid degeneration of the liver, kidneys, etc.

2. Aspiration has given good results in the case of children, and should be tried in them before the radical operation is resorted to.

Aspiration and immediate washing out of the pleural cavity through the aspirator (Kashimura's treatment) has not been used sufficiently often for any conclusion as to its efficacy to be reached.

3. Free incision into the pleural cavity is usually necessary, and the best point for such an incision, when only one is made, is at the lowest point of the purulent collection, and directly below the angle of the scapula. Costal resection is to be avoided if possible, especially in children.

4. Continuous is preferable to intermittent drainage, because (*a*) the danger of absorption is thereby lessened, (*b*) there is usually less danger of irritative fever, (*c*) the empyemic cavity is placed in a better position for healing. Continuous drainage is best effected by a drainage-tube.

5. Through drainage is only advisable in cases where the discharge is very fetid, and where a single opening has proved insufficient.

6. The thoracic opening should not be allowed to close if more than two drachms of pus are discharged daily.

7. The danger of sudden death during thoracentesis or injection of the pleural cavity, when proper care is used, is so slight that it may prac-

tically be disregarded ; but when injections are used, especial care should be taken to see that they have a free outflow.

8. Simple injections of pure water are often sufficient, but compound tincture of iodine, one part to four of water, is devoid of danger, and hastens recovery. This will usually check feter also ; but if it does not, salicylic acid or permanganate of potash in one-half or one per cent. solutions, may be employed. Carbolic acid is dangerous, as is boracic acid also.

9. Listerism would probably be advisable in city or hospital practice, but is of doubtful efficacy in the country, and under no circumstances should it be allowed to interfere with through drainage.

ARTICLE X.

CASE OF EMBOLISM OF THE UPPER TEMPORAL DIVISION OF THE LEFT CENTRAL RETINAL ARTERY. By WM. F. NORRIS, A.M., M.D., Clinical Professor of Ophthalmology in the University of Pennsylvania.

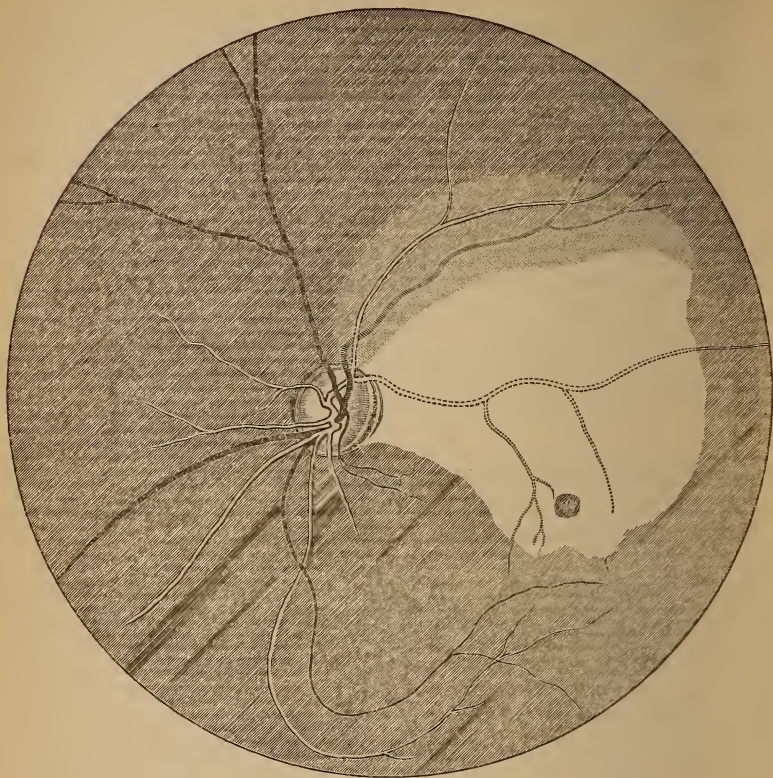
ON November 4, 1881, W. S., aged twenty-nine years, an intelligent German, applied at the out-patient department of the Wills Ophthalmic Hospital. He gave the following history: always had enjoyed good sight until four days ago, when, upon rising in the morning, he accidentally discovered "a mote before the left eye;" this defect coming on without any assignable cause. His general health had not been good for some time past. He was also accustomed to the abuse of alcohol and tobacco.

He was a small, exceedingly anæmic man, with light hair and blue irides; his lips and conjunctival mucous membrane so pallid as to make him appear almost bloodless. The vision of the right eye was $\frac{20}{L?}$, whilst

that of the left was only $\frac{20}{CC}$ in upper field, the patient being unable to fix

with this eye. Ophthalmoscopic examination of his left eye revealed the following picture: Media clear; disk oval 7×9 diameters; markedly grayish in its temporal half. Scleral ring continuous around entire disk, with a trace of conus to its nasal border, and a double pigment loop to its outer side, the inner loop being partially absorbed. Choroid slightly granular. Just previous to the bifurcation of the upper temporal division of the central retinal artery (this point being partially hidden by the corresponding vein), there was situated a whitish-yellow clot. The upper division of the bifurcation formed a whitish streak for about one-half a disk's distance above the disk, beyond this the vessel again contained red blood. The temporal division of the same trunk, was seen as a whitish almost horizontal streak for about four disks' diameter out from disk before vascular red reflex became visible, the first and second branch of this division distributed to the macular region, being barely visible. Corresponding to this area of blood supply, the retina was opaque, more markedly at the horizontal meridian, gradually diminishing upwards until it regained

Fig. 1.



Eye-ground of Left Eye. The dotted portions of the arteries indicate the extent of the loss of blood supply.

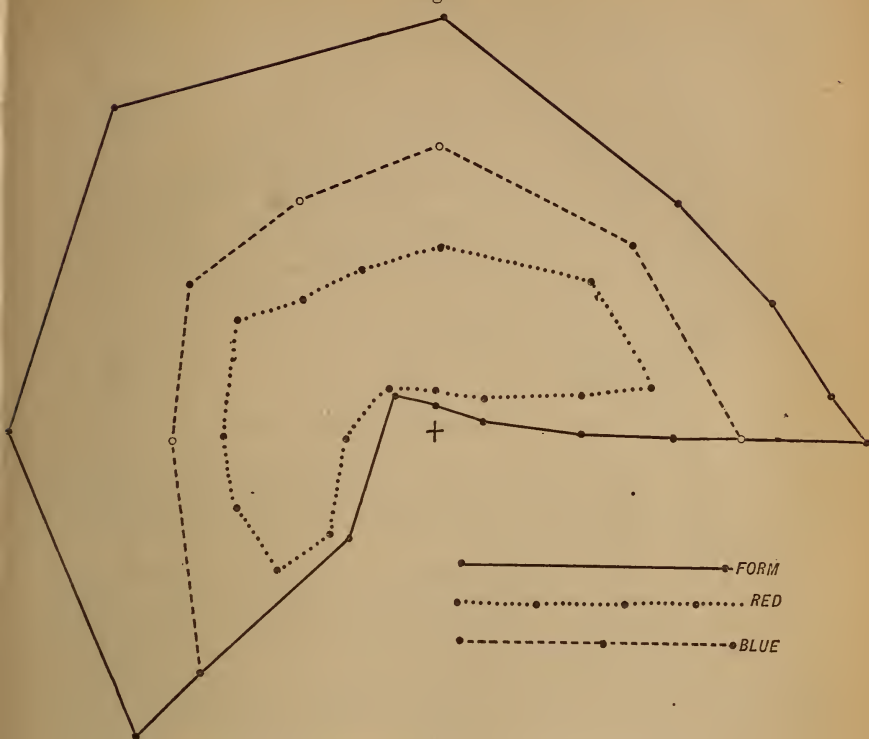
its transparency about five mm. beyond and to the nasal side of the upper division. The lower border of the opaque area, was sharp cut, but irregular in outline, presenting two teats corresponding with portions of the retina supplied by the two smaller branches of the temporal division of the artery. In the midst of this opaque area, the macula lutea appeared as a cherry-coloured spot. Refraction hypermetropic. The right eye did not present any anomaly, the refraction being about the same as in the other eye. H. about 2 D.

The urine was carefully examined, but neither albumen nor tube casts could be found, there being present but a few crystals of uric acid and some vesical epithelium.

Physical exploration showed both mitral and aortic regurgitant murmurs, the latter verified by a rapid diastolic fall in the radial artery.¹

¹ My friend, Dr. J. H. Hutchinson, was kind enough to examine the case, and substantiate the diagnosis of the heart sounds.

Fig. 2.



Field of Vision (reduced one-sixth) of Left Eye, November 4th.

His fields of vision for form, blue and red, were then carefully taken.¹

He was placed upon small doses of iodide of potassium, grains two, three times daily.

Seven days later, ophthalmoscopic examination of the affected eye, under the use of a mydriatic, showed that the cherry-coloured macular spot still remained. The lower division of the artery had blood in it, and could be seen entirely across the opaque patch of retina, which was reduced to one-half its original size and density; it being quite dense immediately above the macula, moderately so to its nasal side, and very faintly so to its temporal side. The teats of retinal haze fast disappearing. Vision remaining the same as on previous visit.

Ten drops of tincture of digitalis three times daily was now ordered in connection with the iodide of potassium.

The field of vision was again taken which showed some very interesting changes. First, that central fixation for form had been wholly regained;

¹ It will be noticed that in the first field under date of November 4th, the day when first seen, presents to us two very interesting points.

First. The position and shape of the field give exactly the region of the affected area and its boundaries.

Second. The absence of any field at the point of fixation distinctly shows that the macula lutea was involved.

Fig. 3.



Field of Vision (reduced one-sixth) of Left Eye, November 11th.

secondly, that the field for blue came down to fixation point, embracing its upper half; thirdly, that the red field still remained eccentric, and fourthly, that the entire areas had diminished to at least one-half their original size.

A week later, November 18th, ophthalmoscope reported that the lower division of the artery had entirely regained its blood current. Contrast of cherry-coloured macula not so marked on account of the increasing vascularity of the neighbourhood, the patch being salmon coloured, and the densest haze just above the macular region. The upper division had also gained its blood current. Great disproportion between the arteries and veins in reference to their calibre. In the periphery of the retina, the calibre of the affected arteries still increased as compared with the papillary end of the same vessel.

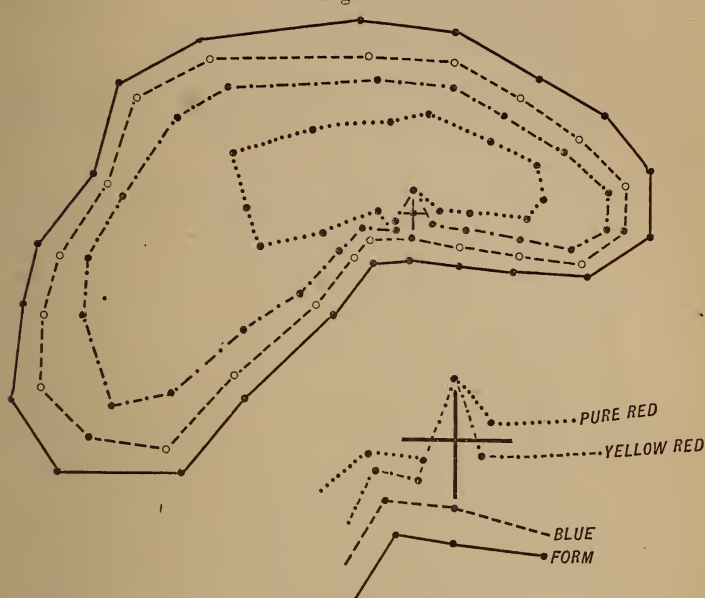
On November the 23d, retina much more hazy, especially around the disk, although a general haze was creeping over the entire membrane. Disk prominent, the vertical vessels being one dioptric in advance of the general level of the fundus. The cherry-coloured macular spot was decidedly granular, and the difference of contrast in colour between the macula and neighbouring retina not as apparent as on previous examination, the boundaries not being any longer as marked with certainty. Vision remains the same. Iodide of potassium stopped. Continued digitalis, and a laxative pill consisting of half a grain of blue mass with a grain of compound extract of colocynth, every night.

Patient reported on the 30th of the month with the assertion that he could see better in the morning just after rising, but vision soon diminished. The ophthalmoscope showed that both the branches were much smaller in the affected region, but larger in the periphery of the retina. Haziness of the retina very much cleared up, allowing entire outlines of disk to be seen. Lower outlines of retinal opacity could no longer be followed more than one-half way to the macula, except by careful focusing. Marked pulsation in the upper venous branch; fainter in the lower.

One week later, ophthalmoscope showed slight haze above the disk, preventing its superior outlines from being accurately seen, and extending along the main upper vein. Macula still granular and reddish. Serous swelling of the retina almost entirely disappeared above.

Fields of vision, taken for a third time, presented some curious and interesting features. The blue field had entirely encompassed the fixation point. The red field had pushed itself well down to the point of fixation,

Fig. 4.



Field of Vision (reduced one-sixth) of Left Eye, December 8th.

almost coming to the centre, leaving a small triangular open space with the base down. The red field was very sharply divided into two distinct areas: one of pure central red, and the other of yellowish eccentric red; the latter area almost double the size of the former. The entire areas of the three fields had increased so as to be one-third larger than at the previous examination.

December 14. O. S. $V = \frac{20}{CC}$ seeing top part of the letter E on a level with his eye, and all of it, eight to ten inches above. Whereas, on all previous visits, the letter was never seen lower than two or three feet above fixation line.

21st. Says "short breathed, and compelled to stop every second or third square whilst walking, and cannot sleep."

Ophthalmoscope showed that the red-cherry colour of macula had entirely disappeared, and was replaced by a dull reddish-brown. Retina everywhere transparent where former opacity had existed, except a slight trace immediately above the macular region.

Told to continue medicine, and to return on the following day to be admitted into the house; but upon his not returning, careful inquiry was made extending over three weeks, when it was found that he had been bedridden from the day of his last visit to the hospital, with what his family physician called inflammation of the stomach. He was afterwards seen by a well-known general practitioner, who diagnosed peritonitis; low fever,

quick feeble pulse, belly painful, swollen, and tympanitic. Patient dying on the seventh day of the attack; conscious to the last, never any headache, lower extremities swollen on last day; passing water up to time of death; death certificate of peritonitis. The medical gentleman who had the case under charge during the last days of his illness, said that he could not give a positive opinion as to whether the inflammation was idiopathic or traumatic. No post-mortem examination was made.

The want of a post-mortem examination is to be exceedingly regretted, although it might perhaps fairly be assumed that the peritonitis was embolic.

Embolism of the central artery of the retina is one of the most interesting as well as one of the rarest lesions revealed by the ophthalmoscope. As Förster remarks, the rarity in comparison with embolic affections of other parts is probably caused by the fact that the ophthalmic artery comes off nearly at a right angle to the internal carotid, and subsequently gives off its smallest branch, the *arteria centralis retinae*, also nearly at the same angle. Emboli are thus readily washed past their orifices and carried on into their other branches. Since Gräfe, in 1859,¹ first diagnosed its occurrence, it has been a favourite explanation of most cases of sudden blindness accompanied by diminution in the calibre of the retinal arteries, and followed by a white retinal haze surrounding a cherry-coloured spot at the macula lutea; and although it has been shown that somewhat similar appearances may be produced by thrombosis of the veins or by retrobulbar neuritis, nevertheless, it remains in many cases the most probable diagnosis. We have since had distinct anatomical proof of the existence in some of the reported cases, in the autopsies reported by Schweigger,² Sichel, Jr.,³ Nettleship,⁴ Priestley Smith,⁵ and Schmidt.⁶ The eye is the only part of the human body where we can during life study the phenomena produced by embolism of an "end artery," and the appearances presented differ in two essential points from those established by autopsy in other parts: viz., there is no hemorrhagic infarctus formed, and no subsequent sphacelus of the retinal tissue. As regards the former, the intraocular pressure is probably sufficient to prevent regurgitation of venous blood into the capillaries of the retina, but in cases of embolism of a branch of the central artery, we have two examples of the formation of such an infarctus, one reported by Knapp,⁷ and one by Landesberg.⁸ Why such retinal hemorrhages should not ensue in all cases where the

¹ Gräfe, A. f. O., v. i. p. 136.

² Schweigger, Vorlesungen über den Gebrauch des Augenspiegels, 1864, p. 140.

³ Sichel, Arch. de Physiol. norm. et path., No. 1, p. 83-89 and 207-218, quoted by Leber.

⁴ Nettleship, R. L., Oph. Hosp. Reps., vol. viii. p. 9-20.

⁵ Priestley Smith, Brit. Med. Journ., April 1874, p. 452.

⁶ Schmidt, A. f. O., xx. 2, p. 287-307.

⁷ Archives of Ophthalmology and Otology, 1869, vol. i. p. 64-84.

⁸ Landesberg, Arch. f. Aug. Ohren Heilk., iv. 1-106.

embolism is limited to a branch of the central artery is not clear, since the venous blood from the adjacent retinal areas, supplied by other branches, could, without hindrance, find its way into the veins and capillaries of the artery which was plugged by the embolus. It is, however, certainly absent in some cases, as in that of Saemisch,¹ and in the one above related; besides, in several other cases, there is no mention of retinal hemorrhages. The fact that the retina does not entirely die when deprived of its own proper circulation is probably owing to the proximity of other parts from which it may, by endosmose, absorb a certain amount of nutriment—notably from the broad capillaries of the choroid. Among the interesting features presented by the above-described case are the exact correspondence of the limitation in the nasal field with the area of starved retinal tissue; the concentric contraction of the field seven days later corresponding with a slight swelling of the disk and a slight haziness throughout the retina, entirely distinct from the dense cloud in the affected embolic area; and lastly, in the evidences presented of vigorous collateral circulation in the macula lutea as evidenced by the gradual descent of the boundaries for form and for blue below the point of fixation, while the line for red almost reached down to it. I have no doubt as to the accuracy of the above results, as the fields were taken most carefully by two observers. In testing for perception of colour a centimetre square of blue and of red pasted on a dead black surface, was used at ten inches distance. Other interesting cases of embolism of a branch of the central artery, besides those previously referred to, are reported by Hirschmann,² Horner,³ Leber,⁴ Steffan,⁵ Landesberg,⁶ Barkan,⁷ Knapp,⁸ and Schoen.⁹

ARTICLE XI.

THE QUESTION OF CONTAGION IN LEPROSY.¹⁰ By JAMES C. WHITE, M.D.,
Professor of Dermatology in Harvard University.

PROBABLY no disease has so excited the fears of mankind and the attention of physicians throughout all historic time as leprosy, for no other has

¹ Saemisch, *Klin. Monatsbl. f. Augenheilk.* 1866, pp. 32-37.

² Hirschmann, *Klinische Monatsbl. f. Augenheilkunde*, 1866, p. 37.

³ Horner, quoted by Zehender, *Handb. der Augenheilkunde*, 1876, vol. ii. p. 125.

⁴ Leber in *Gräfe-Saemisch*, vol. v. p. 544.

⁵ Steffan, quoted by Leber, *loc. cit.*

⁶ Landesberg, *Arch. of Ophth. and Otol.*, vol. iv. p. 106.

⁷ Barkan, *ibid.*, vol. iii. p. 175.

⁸ Knapp, *ibid.*, vol. iv. p. 178.

⁹ Schoen, *Lehre von Gesichtsfelden*, 1874, pp. 93-94.

¹⁰ Read at the meeting of the American Dermatological Association at Newport, August 30, 1882.

produced such hideous deformity of the individual or protracted a termination so uniformly fatal through such prolonged periods of moral suffering; none has spread itself more widely at different epochs among all nations, or has left so marked an impression upon the record of their social and religious laws. Our knowledge of its etiology may with advantage, perhaps, be stated in the beginning, as follows:—

The origin of the disease is unknown, it is too remote for investigation.

There has been no apparent change in its type since the earliest intelligible records, either in relation to chronological or geographical distribution.

It has ravaged countries where it is now wholly absent, although it still survives about the outskirts of some of them.

It is endemic at present over large parts of the earth's surface, and prevails under the most diverse conditions of climate, soil, altitude, temperature, ethnic stock and customs.

Such diversity is a satisfactory demonstration that these extraneous conditions may possibly affect the predisposition to or course of the disease in individual or nation, that their etiological relations cannot be causative.

It is most prevalent among peoples not on the highest planes of hygiene or morals.

It occurs notably in families through several generations, it is claimed, although it fails in great proportion to affect the immediate descendants of lepers. It also affects great numbers of persons residing permanently or temporarily in leprous regions whose ancestry is free from the disease.

It occurs occasionally in sporadic form, that is, in persons who have never visited infected regions.

The period of incubation is without definitely known limits. It rarely appears in children below the age of five. The shortest time of development after residence in an infected region is one year. It has appeared as late as fourteen years after such residence or recognized contact with lepers.

The question in etiology which I propose to discuss has been satisfactorily settled apparently more than once, although in contradictory ways, and so conclusively in modern times in the general opinion of the medical profession that until within a year or two any attempt to re-open it would have appeared almost ridiculous. Some peculiar events in its history of late occurrence, however, would seem to make this not only a legitimate agitation at present, but imperative in the interests of science and national economy.

In the earliest medical records, as well as in biblical accounts of the disease, although it may have been confounded with other affections, it was considered contagious, and the leper was declared unclean. In medieval centuries he was segregated, regarded as a moral monster, forbidden to

marry, or to pass through public ways without a bell or in open daylight. When in later times by the practice of seclusion, then universally enforced, the disease had nearly died out in Europe, driven into the outskirts of the continent where it has since lingered, men outgrew their dread of it, and physicians their knowledge of it, and grew ready to accept any positive doctrine concerning its etiology put forth by individual observers or scientific bodies. Thus it has happened that in the present century, chiefly through the conclusions of Boeck and Danielsson, founded upon their study of the disease in Norway, and through the reports of physicians from many parts of the world, chiefly of a negative character, collected by Virchow and the English College of Physicians, the opinion has been almost universally adopted by the medical profession that leprosy is not contagious, and that it is endemic mostly because it is hereditary. This has become the unquestioned doctrine in the great centres of civilization where books of medicine are made and students of medicine are taught, although popular belief in contagion has persisted to a greater or less extent in the vast peripheric regions of the globe where the disease still prevails. There have not been wanting, however, observers in the midst of the disease who deny the universality of the facts upon which the dogma of heredity has been based, and who claim that those which point to its contagious character have been neglected or misinterpreted. The many other causes, of extraneous origin mostly, which have been assigned from time to time and in various regions, as peculiarities of climate, soil, diet, social customs, etc., need not be considered; they are so diverse and contradictory as to disprove all claim to such relationship.

It is evident, however, that the proper field for the study of this question of heredity is not that in which its chief advocates have laboured to establish it, restricted geographical regions, namely, where the disease has prevailed for centuries among certain classes, and in small districts where affected families have intermarried for many generations. It is manifest that although the disease continues to appear in the descendants of such families this proves nothing *a priori*, for the same continuance among relations may be used, as well, as the best evidence of its communicability by contagion. The theory of heredity will not hold good in any instance without the absolute demonstration that inoculation has been impossible. The theories of heredity and contagion are not incompatible, however, they support each other. We have an illustration of such an etiological relationship in syphilis. The important point to be determined is the proof of the latter, not the disproof of the former. Fortunately for the solution of this question we have in the recent introduction of leprosy into an insular nation, and in several freshly developed foci of the disease upon our own continent, that virgin field for observation so essential for the proper study of this subject.

Hawaiian Islands.—It is impossible to fix the exact date of its first

appearance in the Hawaiian Islands. Isolated cases may, as has been claimed, have occurred as far back as 1830, but it attained no noticeable development until towards the year 1860, when its increase became so rapid and universal, that government took stringent measures to control it. Nor has the mode of its introduction been positively determined. The islands have been the resort for many years of whaling ships manned by sailors coming from leprous regions. The natives have shipped as seamen, and after visiting such infected ports have returned home. The absence of any restraint in the intercourse of native women and strangers is well known. That under such favourable conditions syphilis has run an exceptionally endemic course in these islands has never been considered strange. Whether Chinese immigration has played an important role in the introduction of leprosy there, as has been sometimes stated, is doubtful; at all events there have been very few cases of the disease discovered among them. In 1866 the government opened the so-called "leper segregation" upon Molokai, an island from which there is no escape, since which time some two thousand cases have been received there, and the number at the asylum at present varies from seven to eight hundred. This, however, is not believed to represent the real amount of the disease prevalent in the islands, for many cases are concealed, and some, especially the white residents, emigrate when affected before the disease is discovered. It affects, however, almost exclusively the natives and half-breeds, there being in the asylum three years ago, in addition to these, but one American, one Englishman, and five or six Chinese. As the indigenous population by the last census was only 44,000 the proportion affected is very large. This unwonted rapidity of spread and general prevalence over the islands within the period of twenty-five years cannot possibly be accounted for, it seems to me, on the ground of heredity. Allowing this all admissible action, transference from individual to individual by inoculation seems to be the only possible explanation of all the facts which have been recorded, and nearly all resident physicians believe that the disease is contagious in this sense. Dr. Hillebrand, who has been at Honolulu since 1851, reports several instances where it has spread in isolated villages from a single imported case. Dr. Enders, who reported in his paper read at the Dermatological Section of the International Medical Congress in Philadelphia at the time of the foundation of this society that he had had four hundred cases under his observation, states his belief that it is "often conveyed by 'direct contact' through sexual intercourse or inoculation by other means." He gives several instances where whole families and those intimately associated with them have become diseased. He had seen four cases among Europeans who had been living entirely with the natives and following their customs closely. He believes that where prostitution is most rife there the most cases arise. Dr. Bemiss of Maui, H. I. (*New Orleans Med. and Surg. Journ.*, April, 1880), reports

several cases where neither parent had the disease, and gives details of a case, cited by the legislative committee of the islands, of an American, æt. 55, both of whose parents were healthy, who acted as assistant at the hospital on Lahaina for several years, and in whom the disease appeared after taking some lepers to live with him. Dr. Saxe, President of the California State Medical Society, in an account of his recent visit to Hawaii states that there is no doubt as to its inoculability, and that although not infectious "it is inoculable in every way by which disease can be inoculated." He relates the case of the son of a physician who acquired the disease after inserting a pin into his leg which a little native leper had just previously run into an anæsthetic patch on his own leg. As another instance of the disease appearing in persons resident upon the islands in which there could have been no possible hereditary influence may be noted the case reported by Dr. Regensberger, of San Francisco, in Vol. IV. of our *Transactions*, of a young English girl brought to California from there. Dr. Wood, U. S. N., states in his account of a visit to Molokai that the great majority of lepers point to some association with others as the source of their infection, saying "I married a leper woman;" "my nurse was a leper;" "I lived in the house with a brother-in-law who was a leper;" "I was a prostitute and cohabited with lepers;" "I lived five months in the house with a leper;" "I used to visit, and both eat and smoke with lepers."

Among the thousands of cases which have occurred it may be demanded that those who would account for the spread of the disease in this rapid manner on the theory of contagion should be able to present many and much more positive instances than those just cited in evidence. It may be objected that the cases of the son of the physician, and of the hospital attendant are, even if satisfactorily established as examples of inoculation, hardly enough to warrant the wholesale conclusion that the entire native population has become affected in the same way. It cannot be denied, however, that if we admit this possibility in a single instance, as in that of the boy pricked with the pin just previously thrust into the leper's leg, we must admit also that with the customs and loose morality of this people there can be no reasonable objection to the acceptance of this explanation of the rapid course of the disease in Hawaii. Indeed any other hypothesis seems wholly inadequate and inconsistent with our knowledge of its ordinary course. Either the external conditions of nature must have been extraordinarily favourable to the development of the germs or essence of leprosy, awaiting only the chance arrival of the specific seed to transform this the slowest of all known affections into a rapidly spreading epidemic disease, or the race itself must have been exceptionally receptive, in some mysterious way, of its influence. There is not the slightest ground for either supposition. The islands were natural sanatoria; the people, before syphilization, as perfect a race of beings physically as

has been produced. Heredity, as the only or an important factor, is entirely out of the question; it would have required several generations to have accomplished such results. We must look then to the customs of the race as exceptionally favourable to inoculation as the only possible explanation, such as the crowding together of large families in small huts, sharing the same mats and blankets, eating poi with the fingers from the same calabash, drinking of *ava* from the same vessel, passing the pipe from mouth to mouth, their licentious habits, the absence of all fear or disgust of the disease as a bar to ordinary association, cohabitation, or marriage.¹ The history of syphilis since its introduction into the islands illustrates very forcibly the comparative action of these respective elements in its spread, inoculability and heredity. No one would question the influence of the former in the almost universal spread of the disease among the native population, and yet there is probably not one case in a hundred in which it could be stated in what way and from what source did inoculation take place, provided the period of incubation were extended from months to years as in leprosy. That syphilitic parents may beget children free from the disease, and that syphilitic patients may live for years amidst their family and relatives and friends, and yet not inoculate them, is as strong proof of the non-contagiousness of syphilis as similar negative facts, so often cited with regard to leprosy, are acceptable evidence of the non-inoculability of the latter affection. The wide spread of syphilis, too, among the natives and consequent cachexia have no doubt contributed to establish a national lack of resistance to the ravages of the disease; nor can we overlook the proclivity of all endemic diseases to extraordinary manifestations of virulence in insular nations not previously protected by a gradually inoculated ancestry.

New Brunswick.—Since 1815 leprosy has prevailed among the poor French settlements in a district twenty miles or more in extent, bordering upon the Miramichi River near the bay of Chaleur in the Gulf of St. Lawrence, representing a population of four thousand. Another account refers the introduction of the disease back to the year 1758, through a vessel arrived from the Levant. The first authentic case was that of a woman named Benoit, in the first-named year, whose mother came from St. Malo, in Normandy, and of whose antecedents nothing is known. No measures were taken to control the disease at first, and it gradually spread from family to family, mostly in the descendants of the latter woman whose name was Bredeau. In 1844 the first hospital was built, and during the next five years thirty-two patients were admitted to it. In 1849 the present lazaretto was established at Tracadie, since when it has received more than one hundred patients, making the total number of cases treated in the two institutions nearly one hundred and fifty. Dr. A. C. Smith, of

¹ See account by Dr. G. Wood, U. S. N., in vol. iv., Med. Reports of Navy Dept.

Newcastle, who has been appointed by the Canadian Government to make an annual report upon the condition of the lazaretto, writes to me under date of May 23d, this year, that it contains at present twenty-four inmates, and that he can learn of but four suspected cases outside of its walls. Seven new cases have been admitted during the past year. The most stringent means were at first taken to compel diseased persons to enter the hospital, and they were held as prisoners by an inclosure twenty feet high. There have been, however, many desertions, and in 1875 fifteen lepers were reported as living in neighbouring districts. Since 1868 the institution has been under the charge of the Sisters of Hôtel Dieu, of Montreal, and no police measures are observed to compel residence. According to Dr. Smith lepers are shunned by their relations, and are glad to go to the lazaretto. They do not try to escape, although the doors are open day and night. Affected persons may settle in any part of the province, but they rarely do so, and the disease seems to be confined mainly to a district within seven miles of Tracadie. Lepers are permitted to intermarry freely.

The disease was at first considered to be contagious by some of the physicians who observed it. In 1848 a medical commission was appointed by the government of New Brunswick, consisting of Drs. Bayard and Wilson, who reported that it was not contagious, but that it might be communicated by inoculation in particular cases, although they had met with no such instance. From the replies made by resident physicians to the leprosy committee of the English College of Physicians, it appears that only one believed that it was contagious, and he stated that individuals of different races living in the same house with lepers had become infected. In a report made to the House of Assembly thirty years ago, testimony was presented tending to show that the disease at the start was communicated by inoculation. Dr. Smith states in his letter on the subject published in the second volume of our *Transactions* :—

“ Apparently well-authenticated cases of contagion do exist. The third case that appeared in Tracadie was that of Francis Sonier, who helped to carry a Benoit woman’s coffin in summer time. Matter oozed out of the bottom of the coffin through Somer’s coat sleeve to his body. Within a year afterwards he was attacked by the disease.” Another person attacked was Stewart, a Scotchman, who “ had been in Tracadie in the company of two individuals on whose persons the disease was beginning to make its appearance. Two nephews of Stewart, by the name of Tingley, lived with Stewart, and afterwards died, lepers, in the lazaretto. A man by the name of McCombe, who lived one or two winters in Tracadie, lumbering, died of leprosy.”

If these cases cited by Dr. Smith, viz., the Stewarts, Tingleys, and McCombe, be accepted as authentic, it establishes the fact that persons living in Tracadie and vicinity, not of French descent, and with no known inherited tendencies to the disease, are far more liable to leprosy than those living in other parts of that province. Such cases can hardly be accounted for by calling them sporadic; there can be no question that contagion, if a possible, is the most reasonable solution of such occurrence.

A single case like Stewart's furnishes far more conclusive evidence of contagion than the confinement of the disease to descendants of the Benoit woman in several generations offers of heredity, unless it is also shown that there has been no opportunity of transference by contact from leper to leper through all these years. In order to get some light upon this question, as our only information concerning the disease is based upon reports of patients after admission to the lazaretto, I addressed a letter to Dr. Smith, asking him if the cases received there during the past year came from the households of those previously admitted, and if the seven cases last admitted did not inoculate before leaving their homes other seven cases to be received before long. Dr. Smith was kind enough to send my letter to the intelligent chaplain of the lazaretto, Father J. A. Babineau, who replies as follows: "The seven cases in question have sprung up within a district fifty miles in length. . . . As soon as a case of leprosy is known to exist outside, steps are taken to prevail on the party to enter the lazaretto, which they generally do without much delay. There have been few exceptions, but invariably, I think, the first case was followed by one or two more. A natural aversion to hospital life has made some remain longer at home than they should. Patients are not allowed to visit their homes except in very extraordinary cases. To my knowledge only two, I think, in eleven years have obtained that permission. People outside have access to the hospital grounds, but *never* enter within the walls of the lazaretto except when visiting the establishment. The people generally are under the impression (true or false) that the disease is infectious, and avoid all familiarity and contact." It will thus be seen that lepers are practically treated by the government as though the disease were infectious after they have become inmates of the lazaretto, while no efficient means are taken to eradicate the disease by prevention of transference in family life by the early isolation of all cases. It is evident that under the present system the disease will not cease to exist, but that it will continue in a state of repressed activity, whether this be accounted for on the ground of heredity or inoculation. The weight of negative evidence is as strong against the former as the latter. In Dr. Bayard's report of the twenty-two cases in the lazaretto in 1848 eleven were married and had children:—

Case	1. Peter Savoy,	7 children, none diseased.
"	3. Israel Robicheau,	2 " " "
"	6. Margaret Sonier,	5 " " "
"	7. Julian Ferguson,	7 " " "
"	8. Mary Savoy,	5 " " "
"	13. Lewis Gould,	? " " "
"	14. Fidele Brideau,	11 " " "
"	15. Fabian Gobreau,	7 " " "
"	16. Athenasius Sonier	2 " " "
"	19. Lawrence Comeau	13 " " "
"	22. Margaret Robicheau,	4 " " "

It will be noticed that of the sixty-three children not one is reported as diseased. This certainly shows that there was no strongly transmitted tendency to the affection, for a large proportion of them must have attained the age at which it is prone to develop. But are these facts as conclusive evidence of its non-inoculability? Not if there is a popular belief in its infectiousness which would insure precautions against contact, as the letter of Chaplain Babineau states.

Cape Breton.—It will be remembered that at the last meeting of the Association Dr. Duhring stated that he had received a communication from Mr. Fletcher a medical student, relating to the occurrence of cases of leprosy upon the island of Cape Breton. The results of the observations made by him have since been published by Dr. A. McPhedran, of Toronto, in the September (1881) number of the *Canadian Journal of Medical Sciences*. Mr. Fletcher, who unfortunately was drowned last autumn, is spoken of by our associate Dr. Graham, as a trustworthy student of more than ordinary ability. The history of the affection, as given by him after a most laborious investigation in this wild region, is as follows:—

1. Betsy McCarthy, of Prince Edward Island, a native of Lincolnshire, England, married in 1836. In 1852 became affected and died after twelve years (1864) of what a Tracadie priest called leprosy. She had children:

2. Richard died of same disease after 20 years' sickness.

3. John died of same disease after 12 years' sickness. He married the sister of James Cameron.

4. Mike died of same disease after 10 years' sickness. James Cameron used to sleep with him.

5. William died of the same disease at the age of twenty-one. He was washed and laid out by Joseph Brown.

6. Mary died of same disease after 20 years' sickness. She married John Doyle.

7. John Doyle died of same disease after 6 years' sickness.

8. Daughter of John Doyle and Mary, died of same disease.

9. Daughter of John Doyle and Mary, died of same disease.

10. Joseph Brown attended William McCarthy during his illness, and washed and laid him out after death; was shortly afterwards attacked by same disease and died.

11. James Cameron, of Inverness County, was born in Cape Breton of Scotch descent. Married in 1866 Susanna McCarthy, daughter of Betsy, who with two children is healthy. He used to sleep with Mike McCarthy. His disease began in 1870, and is now well advanced.

It will be seen by this genealogical chart, very carefully traced by Mr. Fletcher under great difficulties, that the disease has been largely confined, as in the Tracadie cases, to the descendants of one woman. The proximity of Prince Edward's Island, her birthplace, to the leper settlements upon the opposite mainland is very suggestive of the possible source of origin of the disease in her case. These descendants, near relatives in a thinly populated district, of course offered the most liberal chances for the transference of contagion by contact, but it will be observed that three persons

having no blood relationship, but all living in contact with the McCarthy family, John Doyle, Joseph Brown, and James Cameron, also became diseased. If these cases were acquired, and it would be difficult to explain them upon any other theory, why is it not much more likely that the McCarthy children also became infected by contagion, as the chances of inoculation must have been greater? Whilst James Cameron, the sole known representative of the disease now upon the island, lives in his condition of advanced tuberculous leprosy, it remains a probability that it will not become extinct with him, but that either his wife or children will continue it for future observation.

Northwestern States.—Leprosy has been known to exist for a considerable time among the Norwegian immigrants who have settled in the States of Minnesota, Wisconsin, Iowa, and Nebraska in large numbers. One hundred thousand Scandinavians are in Minnesota alone, and it is estimated that there are one million in the United States. Dr. Holmboe in 1863, and Prof. Boeck later made visits to these colonies while in this country, and published reports concerning them after their return to Norway. The former found quite a number of cases at that time among the Norwegians, most of which were leprosy before emigration. In a few of them the first outbreak of the disease occurred after their arrival here. In no instance had it developed in a person born in America. The disease seemed to him to run a milder and longer course here than in their former home. Prof. Boeck found only eighteen cases of the disease among his people. In nine of them the disease was more or less advanced before leaving home; in the other half it developed after a longer or shorter residence here, in three of them as late as nine and a half, ten, and fourteen years respectively. It is not stated whether the latter half were living in intimate relationship with the imported cases or not. He, too, found no case in which the disease had appeared in children born in America. It seemed to progress, however, in those affected uninfluenced to any marked degree by their change of residence. Within the last few years reports of several new cases in addition to the above have been collected by the efforts of Dr. Hyde from the Norwegian physicians practising among their countrymen in the northwestern States, which have been communicated to this Association at its annual meetings. One of them reported by Dr. Grönvold, of Norway, Minnesota, came to this country in 1869 when twenty years old. The disease first appeared in 1873; none of his relatives had been leprosy. He thinks that he was infected while acting as a servant at the house of a leper during the year before his coming to America. Dr. Hyde gives, in his report of a case of a Swede from a leprosy family, the interesting information of the probable occurrence of the disease in one of his children born since the arrival of the parents here in 1868. This is the first record of a case born of Scandinavian parentage in this country, and is of especial importance as a child

of a leper of the tubercular form in open ulceration. In reply to inquiry concerning the customs of Norwegian immigrants here, Dr. Bendeke, of Minneapolis, has been kind enough to write to me: "Immigrants and the peasantry in the leprous districts of Norway do not believe the disease to be contagious, nor do they shun the disease. I never observed a case in this country where it was transmitted by inoculation. . . . It occurs in much less proportion here amongst the emigrants than in Norway, and I ascribe this only to the better hygienic situation of the people as to food, clothing, exposure, etc. My friend Dr. Hansen, of Bergen, late surgeon to the hospital for the leprous there, has published cases where inoculation has taken place; before that time the disease has been considered non-contagious." We have yet much to learn concerning the disease in this portion of our population.

South Carolina.—In 1876 I learned through our former associate, Dr. W. H. Geddings, of Aiken, S. C., that cases of leprosy had been observed by his brother, Dr. J. F. M. Geddings, in Charleston, and brief notes of this occurrence were published in the *Transactions of the International Medical Congress* which was held in Philadelphia in that year. The latter gentleman has kindly sent me a tabulated statement of these cases, as follows:—

Tabulated Statement of Cases of Elephantiasis Græcorum observed in Charleston, S. C., from 1847–82.

Name.	Race.	Nativity.	Sex.	Result.
1. Nathans	White	Native Jew	Male	Died.
2. Cohen, M. . . .	"	" "	Female	"
3. Cohen, D. . . .	"	" "	"	"
4. Lopez	"	" "	Male	"
5. Lazarus	Mulatto	" "	"	"
6. Dereef	"	" ?	"	"
7. McGuire	"	" ?	"	"
8. No name	Black	Unknown	"	Unknown.
9. Harral	White	Native American	"	Died.
10. Walker, F. . . .	"	" "	"	"
11. Walker, S. . . .	"	" "	"	Unknown.
12. Moran	"	Irish parents	"	Died.
13. Pritchard	Mulatto	Native	Female	"
14. Moultrie	White	"	Male	"
15. Gaillard	"	"	"	"
16. Jeffords	"	"	"	"

Of these, 11 were whites, 4 mulattoes, and 1 black; 4 were Jews, 1 Irish, 11 natives, 2 mulattoes of possibly Jewish extraction, 1 mulatto of Irish extraction. In answer to my inquiry he states: "I can form no opinion as to when the disease first made its appearance in South Carolina. The case marked 1 was the first which came under my notice about 1846–7. The first cases could not be in any way connected with the old cases of the past century in the Gulf States. Both of the first cases

were Jews from families coming to this country early in this century. Nor could any of the cases have had any connection with the recently imported occurrence in Louisiana, or from African descent through slaves." With regard to the origin of these Jews he says: "Of the three Jewish families the descent can be very clearly traced: Nathans, mother and father German; Cohens (mother and daughter), father Polish, mother English; Lopez, father Portuguese, mother English. In reply to your second question" (whether the persons affected had lived in intimate association with one another?) "I fear that an answer is impossible. The mulatto named Lazarus is said to be the son of a Jew; the others are of uncertain descent. With the exception of this case there was no special association." No new cases have been observed since Dr. Geddings's first report in 1876.

This isolated focus of disease springing up in a community where leprosy had not previously prevailed, and affecting within a few years persons of different nationalities, cannot, of course, be explained upon the theory of heredity, and the cases were too many (sixteen) to be accounted for by the application of that most unsatisfactory term *sporadic*. The most reasonable basis for the explanation of such an occurrence is that of the importation of the disease either through the person of some one of those attacked in a state of incubation possibly, or of undeveloped hereditary inception, or through some transient leprous visitor to Charleston, and the infection of the others from such source of contagion. Such an explanation is perfectly consistent with our knowledge of the laws of those affections of a contagious nature most nearly resembling leprosy, and any other seems impossible. There is nothing known of the circumstances of this limited endemic inconsistent with such a supposition, and the cases occurred at a time when the possibility of contagion was not entertained by those in charge of them, so that any facts pointing to such a conclusion would naturally pass unnoticed. We must expect the data for the full establishment of the truth of this theory to be collected hereafter, when the attention of observers shall have been sufficiently and impartially directed to it.

Louisiana.—It is not known at what period leprosy was introduced into the French and Spanish colonies in the Gulf States, although it is recorded as existing in the West Indies in the latter part of the seventeenth century. Accounts are given of its occurrence in Florida more than a century ago, and it prevailed in Louisiana at that time so extensively that a special hospital was founded for it in 1785. Professor Jones, of New Orleans, in an article on the occurrence of leprosy in the Southern States (*N. O. Med. and Surg. Journal*, March, 1878), quotes from Gayarré's *History of Louisiana* the account there given of the disease at that time. The historian says:—

"It is remarkable that leprosy, which is now so rare a disease, was then not an uncommon affection in Louisiana. Those who were attacked with this loathsome infirmity generally congregated about New Orleans, where they obtained more abundant alms than in any other part of the colony. They naturally were objects of disgust and fear, and the unrestrained intercourse which they were permitted to have with the rest of the population was calculated to propagate the distemper. Ulloa had attempted to stop this evil by confining some of the lepers at the Balize, but this measure had created great discontent, and had been abandoned. . . . The council caused a hospital to be erected for the reception of these unfortunate beings in the rear of the city. The ground they occupied was long known under the appellation of *La terre des Lépreux*. In the course of a few years the number of these patients gradually diminished, either by death or transportation, the disease disappeared almost entirely, and the hospital went into decay."

No account exists of the occurrence of the disease during the present century until the year 1866, when it appeared in Vermilion parish, in a woman whose father came from southern France. Her husband, recognizing the disease, being also a native of France, separated himself from her, fearing contagion. She died in 1870, leaving children:—

Sons	{	1. Leprosy appeared in 1872.
		2. " " " 1871.
		3.
		4. " " " 1872.
Daughters	{	1. Died of acute disease.
		2. Reported to have leprosy.

These children all lived in Abbeville where their mother resided. In 1875 the disease appeared also in a nephew living eight miles from this place. It has also affected a young woman, who is not a relative of this family, but who constantly nursed Madam Ourblanc, the original case, during her last illness. The disease developed in her in 1873. It has appeared, too, in a young man living a few miles from Abbeville, in no way related to any of the above, but who frequently slept with the fourth Ourblanc son during the year 1875, while the latter was peddling through the parish. In 1877 the case was sufficiently advanced to be recognized as leprosy. Dr. Jones states that other cases are reported to be (1878) in the parish.

The history of these cases, which could have had no connection with those of the past century, is very interesting. The origin of the disease in the first case is obscure. It seems improbable that this woman should have borne through a long life the inherited germs or elements of the affection from some remote ancestry in France, to assume in 1873 for the first time such activity; yet such is consistent with the commonly accepted laws of heredity as applied to this disease. But however inexplicable it may be, with our limited acquaintance with all the circumstances of Mad. Ourblanc's life, the original case, those which follow can certainly not be explained upon such a theory of transmission. They developed all too rapidly, and well nigh simultaneously after it, to make any such supposi-

tion at all plausible. How much more reasonable to regard these five cases, the three sons, one daughter, and the nephew, living in a small town, and of course in frequent communication, more or less intimate, with the original case, which was one of extensive ulceration, as the result of infection. In the case of the nurse in constant attendance upon her in her last illness, and in that of C., the frequent bed-companion of the youngest son diseased, no other explanation is possible. It seems to me that they establish the fact of the contagious nature of the disease beyond dispute. Since the development of this outbreak in Vermilion parish the disease has appeared in several other districts in the State, particularly in that of Plaquemines, and in the city of New Orleans. It would be interesting to learn into what parishes the affected sons of Madam Ourblanc had extended their travels.

California.—It is not surprising that with a population of 20,000 Chinese in this State not a few cases of leprosy should have appeared among them. An excellent account of it, as observed in the hospital for lepers in San Francisco by Dr. J. W. Foy, was contributed by him to the last number of our *Transactions*, by which it appears that fifty-two cases had been admitted up to that date, during the preceding ten years. These, with a single exception, were Mongolians. This number represents no doubt the majority of the cases in the State, so that as all the lepers are shipped back to China there can be no great number present in California. After the last shipment, however, fourteen new cases were admitted to the hospital within the following year. The cases must leave home in the incubative stage, for it is not to the advantage of the shipping companies to send over diseased workmen. The Chinese believe that the disease is contagious, and will not work in the same room with a leper. Thus far no case has been reported of a native citizen of California acquiring the disease. To what extent the Chinese may have communicated it to each other while here, there are no means of ascertaining; but, from their peculiar customs of herding together, favourable opportunities of such transference cannot be wanting.

Oregon.—In this State the disease has likewise appeared among the Chinese, but the recent laws adopted by the National Government will, for the present at least, check its fresh importation upon the Pacific Coast, although cases will no doubt continue to develop and be discovered among Mongolians already resident.

But how shall we explain the occurrence of the cases which have been reported by competent observers, from time to time, outside these modern centres or foci of disease, the so-called sporadic instances? Is it possible that a disease so typically endemic in its geographical distribution and historic course is capable of originating, *de novo*, in regions where it has not prevailed for a century or never existed before? Can there occur now and then and anywhere such an exceptional combination of favourable

conditions independently of the influences of heredity or contagion, that the spontaneous evolution of the disease necessarily follows? How is it possible for the strict upholders of the theory to exclude the former even on this virgin soil of America in dealing with such cases considering the mixed ancestry of our population, for as they trace back such etiological influences to grandparents and great-grandparents at times, how can they limit its activity to two and three generations, why not grant it to the tenth even? And then how can it be positively determined that cases to which the title sporadic seems legitimately applicable, *i. e.*, those recorded by competent observers, so that the diagnosis is unimpeachable, and which have never visited any country where the disease prevails, which have not even left their native districts of New England or the Middle States for instance, have not come in contact with lepers without their knowledge, and thus have acquired the disease? Such a supposition is not only credible; facts abundantly give support to it. Take my own single experience as an instance. One of the Tracadie cases escaped from the lazaretto twenty-five years ago and was for a considerable time a resident of Boston under an assumed name. He was under my charge for months at the Massachusetts General Hospital. Who can now trace his wanderings in New England at that time, or know that no one was infected by contact with him then? There has died during the past year under my care one of the Louisiana lepers from the Plaquesmines district. He, too, was living under a feigned name in the vicinity of Boston. Such cases are of course not limited to the observation of one individual. Another Tracadie case has been known in Boston, and one lately discovered in Providence and taken back to the lazaretto. Yet it was not generally known that such concealed foci of the disease were existing in the midst of such thickly populated districts even at the time, and the outbreak of leprosy in any individual there after the lapse of years, it may be as the result of unknown contact and infection, would be regarded by patient and physician as necessarily "sporadic." I cannot but regard this term with great mistrust. If a lie is a natural feature for elimination in the history of a kindred disease, unconscious deception is to be considered as an element not to be disregarded in the patient's history in every case of leprosy.

This brief account of the geographical distribution of the disease in North America suggests a mention at least of the sources from which it has been derived, and the dangers to which we are still exposed through immigration from them. Spain, at the time of her colonization of the southern portion of North America, had many lepers within the home kingdom through whom in Mexico and the Gulf States the seeds of the disease were planted. Her island colonies in the Spanish main also served, as at the present day, for distributing foci in their intimate commercial relations with our continent. Of this implantation, however, no traces, save those of historical record, remain along our shores, although it sur-

vives in a state of no inconsiderable activity in the West Indies and the maritime countries south of Texas.

Portugal, too, scattered her leprous settlements over many of the islands of the Atlantic, with which our sailor population has kept up constant intercourse through our various fleets. It is from these two sources that the occasional cases among our native stock, those known to have been acquired out of the country, have been derived.

From Africa also we drew a supply of the disease in connection with our importation of negroes, and the instances observed among the blacks in the Southern States, up to a very recent period, were no doubt largely of this origin. With the cessation of the slave trade we were relieved from this source of danger.

France, as we have already seen, peopled her North American colonies in the gulf with numerous lepers, so that old world and old time means were employed in dealing with the disease, so successfully that it was eradicated before Louisiana became one of the United States. But the home country remained leprous in some of her districts, and has succeeded in re-establishing, through her emigrants, the modern outbreak of the disease in Louisiana we have just been studying, although its immediate origin is so completely a mystery at present. In Tracadie, too, the disease originated in and has continued to affect mainly the residents of French origin, although in neither instance were those first attacked direct immigrants from their mother country.

From the infected regions of Norway and Sweden immigrants are constantly pouring into our land and forming a new Scandinavia in our north-western States, with a not inconsiderable number of lepers at least in the incubative stage among them.

And upon our Pacific shore, both in California and Oregon, the much feared invasion from China was certainly not without its tangible elements of evil in the victims of leprosy already developed amongst us. Thus both at the extreme north, and south, and west of our boundaries, and directly in the heart of the country have been planted centres of the disease, from which under favourable conditions it may spread in all directions.

If from this brief study of the course of the disease in our midst and in our own time we find evidence that it is communicable from man to man by direct transference, or facts which can be interpreted in no other reasonable way, and this conclusion I, after due consideration, must accept, how far is this supported by the general history of the affection in past times as related by medical chroniclers? There was a period when leprosy was one of the most common diseases of civilized Europe, when the lazaretto was as universal as the modern lunatic asylum. If not imported directly by the Crusaders returning from its early home in eastern lands, it was certainly far more prevalent and widely distributed after these events. Belief in its contagious qualities was then universal, because

observers then possessed the same opportunities of witnessing its progression over a virgin soil and among unaffected nations that we are just beginning to study amongst ourselves. The leper was shunned, his personal belongings were avoided as unclean. He became the object of relentless laws and lost almost a claim to humanity. No disease has ever met such vigorous quarantine enactments. The result of all this moral isolation and enforced lazaretto life was the gradual extermination of the disease in the centres of population and its expulsion to certain corners and border lines where, at first in concealment and later in neglect, it has lingered down to the present day. Without a revival of the strictest enforcement of these same laws it will still hold its ground in these lurking places scattered over most of the European States, or will increase yet to a more terrible magnitude, as in Norway. Under the seemingly more humane but dangerous theories of Boeck and Danielsson respecting its nature, which allows the leper to associate safely with his fellow-men, we should expect the disease to flourish as it does and to affect the many, who, as is well known, can plead excuse for its presence under this fallacious doctrine of heredity. The sterner judgment of the middle ages, which made the leper individually the responsible agent of communication rather than the progenitor, must again be adopted before the affection will be subdued in Scandinavia.

History then seems to confirm the lessons to be drawn from modern observation regarding the communicability of the disease, so far as conclusions are warranted from the opinions then generally held, and the laws then in force. These lessons or deductions which, as it seems to me, we are forced to draw from the data I have thus presented (how imperfectly as a demonstration in any sense I am too well aware), justify in my opinion the following conclusions: Leprosy has spread under recent observation, when introduced into a previously unaffected stock, in so rapid and general a way as to prove that it may diffuse itself universally through a nation independently of the action of hereditary tendencies. There is no evidence to support the assumption that this wide and quick extension of the disease has been caused or aided by any peculiarities of soil, climate, diet, or other telluric agency in Hawaii. The history of the affection, on the other hand, leads to the strongest conviction (scientific proof is well-nigh out of the question) that it is communicated directly from person to person, while the peculiar customs offer a satisfactory explanation of its unparalleled spread. The history of the little centre of disease in Louisiana, watched fortunately from its very beginning, leads to the same conclusion that it affects persons not under any law of heredity but through the intimacy of personal relationship, the customs and morals determining largely the rapidity and universality of its spread. So, too, syphilis abstracted from its venereal relationships, could exist as a disease, and does communicate itself in no inconsiderable measure in various other

ways. It is only through the assistance of the loose sexual customs of certain grades of the population everywhere that it has become such a world wide pestilence. Take away from it its characteristic initial lesion and give it a greatly prolonged incubative stage, and the difficulty of determining the circumstances of inoculation would be as great as in the disease we are considering.

It is probable that leprosy may, like syphilis, be communicated under all circumstances by which some of the fluids and other products of the infected foci of a diseased person come in contact with abraded or excoriated, possibly with the uninjured surface of a healthy person. Such favourable conditions might happen during coition, vaccination, kissing, in using the same utensils in eating, drinking, or smoking, in handling the diseased parts in hand-shaking or nursing, in sleeping with the patient, or in other ways. It would be necessary that the diseased products should be at the surface of the skin or mucous membrane, and this would generally be accomplished during the process of softening by which the impermeable epidermal layers were removed. Thus the nodular form in its ulcerative stage would necessarily be the most dangerous phase of disease, whereas the anæsthetic form might exist for years with little danger of communicating itself to its surroundings. In this sense we may conclude that leprosy is contagious, and in these ways do I believe that the disease mostly spreads in a family, a community, a nation. I would not exclude hereditary transmission as a direct cause in individual cases, although how largely the disease originates in this way and how remotely such influences may extend our exact knowledge is very deficient. Positive information upon this point and upon the limits of incubation is yet to be almost wholly acquired.

That recent observers and those dermatologists who have lately studied the disease have become more and more inclined to regard the exclusive dogma of heredity as unsatisfactory, and to accept contagion as an important factor in etiology, the following opinions very strongly show. In the replies to Virchow's questions respecting the disease sent out in 1860, there were many which were in conflict with the conclusions of the committee of the English College of Physicians, "that the most skilled physicians in all parts of the world are entirely opposed to the belief that leprosy is contagious." Dr. McNamara in Bengal, who was seeing three thousand cases a year, believes that it is contagious, and mentions cases in confirmation. Dr. Lob, of Hong Kong, says: "It is contagious beyond a doubt." Dr. Friedel, of China, states that it is communicated by inoculation during sexual intercourse. Dr. Wolff, of Madeira, gives cases of contagion. Dr. Wucherer, of Brazil, gives cases also, but says that the anæsthetic form is not contagious. A missionary resident ten years in a large leper hospital in Trinidad, cites instances of contagion in his

book (*La Lèpre, est Contagieuse*, Paris, 1879). Dr. Manson, in a report published by the Inspector-General of Customs, Shanghai, 1881, says:—

“In the face of certain well-known facts in the history of the disease, it is difficult to understand how its communicability can be denied. I can only explain the denial by the absolute ignorance which prevails as to the steps, etc., of the disease. . . . Leprosy is studied only in hospitals, rarely in its proper home, and genuine efforts to study there the history of its beginnings and the secret, perhaps, of its cause have been few.”

Dr. Tillbury Fox, in his last book, said:—

“There is by no means a slight body of facts which seem to indicate that the inoculation with matter from a leprous sore, and this may occur in cohabitation and constant contact and in vaccination(?), may give rise to the disease.” And again: “Leprosy is apparently spread by the free contact of the healthy with the leprous.”

Neisser says: “Leprosy is probably an infectious disease, and its specific products are contagious.” Köbner, in his recent paper (*Virchow's Archiv*, Bd. 88), on the inoculability of the disease, says, with regard to this question: “The isolation of the leper by confinement is the best means of overcoming leprosy as an endemic disease.” Kaposi (*Path. und Thérap. der Hautkrankheiten*) says, upon the same point: “Freilich kommen da merkwürdige Fälle vor.”

But if contagious, what is the contagious element in the disease? A constitutional virus peculiar to it, or a foreign organism, an entophyte, which is the sole cause of the local tissue changes and indirectly of the subsequent systemic changes? I must confess that the latter theory is to me the most satisfactory explanation of the peculiar features of the affection, and that I am prepared to receive proof of the existence and etiological relations of such a specific being as the *bacillus lepræ*. Is this proof at hand?

Bacillus.—In 1873 Hansen first called attention to the presence of bacteria in leprous tissues, but the medical world was not ready to accept the announcement in its full signification; it had been over-credulous in receiving hastily made observations and inconsequent conclusions as established facts in this field of research. Since then it has become prepared, by better work and more critical and educated judgment, to estimate the value of such discoveries. The parasitic nature of certain so-called constitutional diseases has been established, giving reasonable ground for assuming that others may yet be proved to be of a similar character. There is nothing in the history or pathology of leprosy incompatible with the theory of its parasitic nature. Should a bacterium be constantly found in the disease, in the leprous tissue itself, most pronounced in that in process of development, presenting the same characteristic features in cases occurring in all parts of the world, and not found in human tissues in connection with other diseases or in their healthy condition, it would

constitute strong presumptive evidence that this parasite was the specific cause of leprosy. The proof would be positive if its inoculation were found to reproduce the disease. What facts have we to support such a supposition? Within the last year or two Hansen's observations have been confirmed by several most reliable investigators, among whom may be mentioned Neisser, Koch, Kōbner, Cornil and Souchard, and by Dr. Berman in this country. At our last meeting we had opportunity of seeing this so-called bacillus demonstrated by Dr. Atkinson, as prepared by the latter gentleman. There can be no doubt of the existence of this object in the various tissues of the disease in my opinion, and but little of its nature. The failure of some good observers to discover it in cases of the disease may be satisfactorily explained by their inexperience in conducting the complicated processes by which its presence is to be discovered. Others who have likewise failed at first have later learned to work more successfully. Nor can this complexity of manipulation be urged as ground for mistrust of the genuineness of the results obtained, for the same objection applies to proofs of the existence of several of the normal tissues of the human body. Of the specific character of these growths and of their etiological relations to the morbid tissues in which they occur, and to the disease as a whole, there is room at least for a suspension of judgment. *A priori*, there is no reason why the bacterium found may not satisfactorily explain all the local and general pathological processes characteristic of the disease, and it has been found in connection with cases from so many parts of the world and by so many reliable and experienced observers, and has, under all circumstances, presented so uniformly identical appearances that the probability of such specific relationship grows stronger and stronger. The results of inoculation are as yet negative. The most recent attempts in this direction are the recent experiments of Prof. Kōbner, of Berlin, carried on with the assistance of Koch. The results were negative. None of the animals inoculated lived long enough to fulfil the probable minimum period of incubation of the disease in man, and it may be that the bacillus is incapable of growth in the tissues of other animals. In some Utopian epoch let us hope that humanity may reserve her condemned criminals for such experiments. Until then this question may have to await its complete solution. I cannot forbear, in this connection, to recall one of Kōbner's observations: The leprous nodule for his inoculations was excised on April 12th, and was found to contain an abundance of bacilli. The wound cicatrized, but in October became excoriated in the bath, forming an open sore. The granulations and pus removed from this were found to be filled with bacilli. Can any one doubt the dangerous character of this sore? Is there one of us so skeptical as to the possibilities of the experiment as to have been willing to apply it for a moment to an abraded surface upon

his own skin? Such contact, I believe, to be the frequent cause of the spread and perpetuation of the disease.¹

If then we are prepared to admit the contagious nature of leprosy, using the term with the meaning above defined, what measures should be taken for its exclusion from and repression within the country? Is isolation effective, or necessary, or justifiable? Should immigration from infected nations be prohibited? That the establishment of lazarettos and special laws for lepers were everywhere considered necessary, and that the disease disappeared almost wholly from civilized Europe thereafter in historic times there can be no doubt; nor of the fact, on the other hand, that the only place there where it holds in any degree its old importance as a national evil is Norway, where the necessity of such institutions is publicly and privately disbelieved in. In modern times the revival of enforced isolation on any large scale has been tested in the Hawaiian Islands alone, and here the necessity and effectiveness of the stringent government measures in this respect are admitted by all resident physicians as well as by lepers themselves. The resident Governor of Molokai, a talented lawyer who voluntarily exiled himself thither on discovering himself to be a leper, declares that all who doubt that the disease is contagious are dreamers, and that any one who would be willing to return to his home and spread the foul contagion among his friends and countrymen is worse than a traitor to the Hawaiian nation. It is a pity that the system was not adopted before the seeds of the disease were so universally distributed. The experiment at Tracadie has never been carried out with sufficient stringency to fully test its efficiency, as is evident from the accounts above given. With the lazaretto unsupported, as has been the case, by proper compulsory laws, there is no doubt that the disease has been held only just within bounds, nor that under the present management it will continue to hold its own. Such half measures are mere trifling.

We have at present an unknown number of lepers in the United States—let us say fifty or a hundred; one centre in Louisiana, another in Minnesota, Wisconsin, and Nebraska, another in California, and Oregon, affecting three entirely distinct nationalities, in different climates, and under quite diverse methods of living. It is evident that the disease may make more rapid advance in one part than in another. Any circumstance, for instance, which tends to soften or abrade nodules, as a hot climate possibly, would of course greatly increase the danger of infection, so that the necessity of interference by compulsory means might be more urgent in the former than in the latter. It is evident, however, that such measures should be undertaken by the national government, and that they should be made applicable to all parts of the country alike. We have a

¹ For recent observations on bacillus lepræ see Hensen, Virchow's Archiv, 1880, Band 79; Neisser, Virchow's Archiv, 1881, Band 84; Cornil and Souchard, Annales de Derm. et Syph., 1881, No. 4; Köbner, Virchow's Archiv, 1882, Band 88.

National Board of Health to which their execution might be entrusted. There can be little doubt of their necessity, or of their success in eventually exterminating the disease. When this necessity becomes more apparent this result will be immensely more difficult of accomplishment. These measures should be—the establishment of graded hospitals in possibly insular localities in various parts of the country, to which all access should be prevented excepting under restrictions determined by professional rules; the enactment of laws which should make residence compulsory and perpetual, and the concealment of the disease punishable by severe penalties. These rules should apply to so-called sporadic as well as to endemic and imported cases, but the latter might be given the option of returning to their native land. The immigration of lepers should be prohibited and arrested at ports of arrival by inspection so far as possible, as other contagious diseases now are by quarantine regulations. By the establishment of such national measures immigration from leprous countries would largely cease, lepers would no longer change their residence within the country to escape the action of local laws against their liberty; marriage with them would become abhorrent when the people had thus become aware of its dangers, and after a generation has passed the disease should be virtually eradicated.

But are such measures justifiable? it will be asked; why not so, as much as the national laws concerning yellow fever, and municipal regulations against smallpox? These kill their victims quickly and intermittingly, leprosy after years of frightful disfigurement and pauperism. If we cannot prevent our country from becoming the refuge of the world's criminals, we may at least take such action that it shall not be made the asylum for its infectious diseases. If Draconian laws regarding marriage and intercourse could stamp out consumption and syphilis, as some day they will, who would feel that he had a right to oppose them? Lepers belong to the dangerous classes of the community which require perpetual confinement, and the sooner this remedy is applied the less seeming cruelty will attach to it. •

ARTICLE XII.

SALIENT POINTS IN WHICH EYE DISEASES MAY HELP OR MISLEAD THE GENERAL PRACTITIONER IN DIAGNOSIS. By WILLIAM C. AYRES, M.D., New York, Assistant Surgeon to the New York Ophthalmic and Aural Institute, Assistant to the Chair of Ophthalmology in the Medical Department of the University of the City of New York.

It cannot be denied that ophthalmology is one of the most advanced of all the branches of medical science; and considering the intimate relation of all parts of that wonderful structure of the human system, we would

naturally expect to find that a knowledge of eye diseases would be of material assistance in enabling the general practitioner to arrive at a correct diagnosis of disease processes in localities far remote from the organ of vision. In fact we find it so. Therefore in the following pages we will call attention to some of the salient points in which eye symptoms can aid in general diagnosis and prognosis.

I. INTERNAL EYE DISEASES, OR THOSE DETECTED WITH THE OPHTHALMOSCOPE.

Meningitis.—I know of no symptom which could possibly afford more pleasure to the doctor and the friends than that which says: “the patient, who has been suffering from a meningitis, is commencing to improve.” This is the direct answer which the ophthalmoscope gives us, on examining the retina and optic nerve entrance in the background of the eye, when such an improvement commences.

As an illustration we will take that type of brain trouble, which results from a continuation of a mastoiditis to the cerebral contents; since such a meningitis does not differ to any great extent from other brain processes, as far as the eye symptoms are concerned.

In very recent literature, Prof. Zaufal, of Vienna, writes: that in ear diseases, an ophthalmoscopic examination is indispensable, as an indication of the necessity of trepanation of the mastoid process, since an appearance of inflammation at the optic nerve entrance into the eye, warns us that there has been a continuation of the disease in the mastoid cells, or tympanic cavity to the brain—either in the shape of a meningitis or thrombosis of the cerebral sinuses. The ocular manifestation is very easily recognized with the ophthalmoscope.

The nicety of this method of examination consists in the fact, that the optic neuritis or neuro-retinitis often warns us of a cerebral complication before any other meningeal symptom is pronounced. Also, when the meninges of the brain have become inflamed any change in the already established disease is most easily recognized in the background of the eye. Again, if the disease is on the increase, we observe a corresponding increase in the severity of the optic neuro-retinitis; and, if it is on the decrease, the first place to show it will be the retina and optic nerve.

To show how trustworthy the eye symptoms are, and how delicate and reliable the method of examination is, after a trepanation of the mastoid process for meningitis from ear disease, the eye next to the diseased ear is the first to improve if the patient is going to get well; later both eyes improve, the former improvement being almost immediate after the operation, the latter also in a very short time.

The reason why the eyes should be most carefully examined in diseases of the brain, is because the retina and optic nerve furnish the only nervous

expansion communicating directly with the cerebral contents which we can inspect.

If we remember the method of development of the retina and optic nerve from the very walls of the embryonic anterior cerebral vesicle, and keep in mind all the changes they go through until they result in the adult organ, we see that the retina and optic nerve have always been in direct continuation with the cerebral contents, and always remain so. Then, again, the dural and pial sheaths of the optic nerve are directly continuous with the dura and pia mater through the optic foramen; the lymph space contained between them is also continuous with the subdural space in the brain. Therefore, since the retina and optic nerve are integral parts of the brain, and since we can get a clear view of the one and not of the other, how very important the examination of the eye becomes when it affords us direct knowledge of what is going on in the brain, a part of the body which we cannot inspect (the examination of the optic nerve with the ophthalmoscope being so very easy).

Some of the diseases which we will consider as lending aid in general diagnosis or prognosis by the symptoms produced in the eye, require a certain dexterity with the ophthalmoscope, and we will consider that the reader has the requisite amount of practice to interpret the eye symptoms correctly.

The idea naturally suggests itself, that any one who is not very awkward, can gain sufficient dexterity with the ophthalmoscope in six weeks or two months, under a competent instructor, to make it an instrument in his own hands, more powerful in general diagnosis than any he has ever had before. And when a combination of circumstances will enable him to save the life of a patient by such knowledge, he will certainly not regret the few days spent in acquiring it. The ophthalmoscopic appearances of optic neuro-retinitis will be given later under the head of Bright's disease.

Alcohol and Tobacco Poisoning.—It may not be out of place to enumerate the local eye disturbances, and consequent diminution of sight brought about by the use of alcohol and tobacco, since they are so very easy of observation and so very important to the patient. A patient comes to a doctor and tells him his sight has been gradually failing for some time past, and wants to know what he shall do for it. If the physician looks into his eye with the ophthalmoscope (the external appearances are normal) and sees a paleness of the optic nerve entrance without any other marked objective symptom, he may question him at once if he is fond of alcohol or tobacco. In the majority of cases he will say that he partakes only to a limited extent, and this may or may not be the case, since the eye symptoms are often brought on by a very small quantity of such stimulants. The next examination will be made by taking a small piece of red or green paper and directing the patient to look directly

at it. If the failure of sight is caused by alcohol or tobacco poisoning, the colour of the paper will not be recognized. They cannot distinguish between red and green, and may call both gray. In advanced cases blue will not be recognized in the same way, but they generally know yellow (its complementary colour).

If they fail in these tests for central vision for small pieces of coloured paper, but recognize larger surfaces of the same colours, they have what is called "central colour blindness." If this be present, combined with paleness (atrophy) of the optic nerve, liquor and tobacco are at the bottom of the difficulty almost to a certainty. If the patient stops these stimulants *immediately*, and takes iodide of potash, his sight may return notwithstanding the atrophic appearance of the optic nerve; but, if not, he will certainly have ultimately to be led about the streets by some of his friends, as total blindness will be sure to follow.

The ophthalmoscope gives the doctor a direct means of diagnosing this condition; and in fact almost the only means, since no one would think of examining the central colour perception first, although the central colour defect is the differential symptom, since atrophy of the nerve may be the result of many other causes.

Retinal Apoplexy.—In the same way when there are hemorrhages in the retina of an older person without any apparent cause, this symptom may lead us to expect a subsequent cerebral apoplexy. At any rate it will tend to put the doctor on his guard.

Leucocythæmia can always be first discovered by examining the retina with the ophthalmoscope, but since the disease is comparatively rare, space must make us refer the reader to some text-book on ophthalmology for the corresponding eye changes. The same may be said of *oxaluria*, *lead-poisoning*, etc.

Bright's Disease, as demonstrated in the eyes, holds a very important place in the series of affections under consideration. The changes in the eyes are so very characteristic, and I may say constant, that we may be sure, that when such appearances are found in the retina, we can diagnose the kidney disease even if there is no albumen in the urine.

The changes in the optic nerve and retina in this particular disease are very peculiar. First of all we may notice an optic neuritis, which does not differ to any great extent from any ordinary neuritis. The chief symptoms of an inflammation of the optic nerve, are swelling of the nerve where it enters the eye (optic disk or papilla), and a certain continuation of such swelling over to the adjacent parts of the retina. By this condition the contour of the nerve is rendered blurred, and the nerve looks puffy (choked disk). In the normal eye, the optic disk is sharply defined, being more or less elliptical in shape, on account of its oblique entrance into the eye, or rather from the fact that we look at it obliquely. The

nerve itself may be likened to a cylinder; but as all oblique sections or projection of the cylinder are ellipses, the contour of the disk has the latter shape.

Besides the ordinary form of optic neuritis we see in Bright's disease, we may notice numerous small hemorrhages in the retina; these are probably the result of a complication of the walls of the bloodvessels, and congestion from the concomitant inflammation. These two symptoms are, however, not alone pathognomonic of albuminuria. But when we find them in connection with a *system of white dots* or spots, arranged around the yellow spot (*macula lutea*), and the point of distinct vision (*fovea centralis*), like the rays of a star, we may safely make the diagnosis of Bright's disease of the kidney, even if we do not find albumen in the urine on testing it in the usual way with heat and nitric acid.

I remember such a case in the practice of one of our most celebrated oculists, in which the patient had simply come to him to have his eyes tested for glasses, since he did not see quite well. The doctor was unable to bring his vision up to the normal by any simple glass or combination of glasses. On examining the background of the eye with the ophthalmoscope (and from this examination alone) he diagnosticated kidney disease. The family physician was told that such was the case, when he examined the urine, but found no albumen or other abnormal constituent. He, therefore, discredited the diagnosis, and told the patient that he was a perfectly healthy man. The peculiarity of the case was, that the condition of his eyes went on without treatment for eight to nine months; but after that time, albumen began to appear in the urine, and the man died in about one year ultimate to the first detection of albumen, having had his kidney trouble for full two years or more.

Many such cases are met with, and I may say are so much the more important, since it may be that an energetic treatment may ward off the usual result, or even cure the affection; and we are able to do this simply by virtue of the fact that its existence was *made known in time* through an ophthalmoscopic examination of the region of the yellow spot. There are various other changes in the retina in albuminurea, but the above is sufficient to detect its presence.

If anything could possibly suggest the value of eye symptoms in making a diagnosis of a disease far remote from the organ of vision, this is certainly one.

The eye symptoms also point out the unsuspected presence of albumen in the urine, which happens so often during or after pregnancy; and here too an ophthalmoscopic examination is invaluable to the general practitioner of medicine.

Let us follow a little further those systemic diseases in which the background of the eyes reveal to us conditions which no other part of the body is capable of doing.

Effects of Medical Agents given for Systemic Diseases; Quinine.—Suppose, for instance, that a patient to whom the doctor has been administering large doses of quinine, comes and says she cannot see as well as she used to (this would only be in a very light case of quinine poisoning). The ophthalmoscope is used, and the optic disk is seen to be pale, the arteries small, and the rest of the eye apparently normal. If we then examine the field of vision (viz., how much the patient can see with the peripheric portions of the retina, the most convenient way to examine which we will mention later), and find that the eye is blind except in a small horizontal zone, or that the visual field is very much constricted, the doctor is at once admonished by such a condition that his patient is being poisoned by the drug he has been administering. He will also know that if the quinine is continued the patient will become totally blind and deaf.

Quinine amaurosis, as it is called, or loss of sight from quinine, has been long known to oculists both in this country and in Europe, but its exact nature has been investigated only of late years by Roosa, Knapp, Grunning, Michel, Hobby, Wecker, Voorhies, and others (their articles having been published mainly in the *Archives of Ophthalmology*). At present it is a general affection which every doctor, and especially those in malarial districts, should be able to recognize by the eye symptoms alone, since, if he does not, he may do his patient an irreparable injury.

The effects of the disease on the eyes may be learned from a case recently published by Knapp; and since he has summed it up nicely we will insert it. He writes:—

“On February 16, 1878, the seven-year-old daughter of M. L., of New York, was brought to my office on account of an impairment of vision. I learned from the mother that the child three months previously had been suddenly taken sick in the afternoon with high fever, nausea, vomiting, and restlessness, but no spasms. She groaned frequently, and was delirious for twenty-four hours. She was treated by Drs. Simmons and Whitall, and took a great deal of quinine. On the sixth day she became hard of hearing, and for four days she could not see anything; the pupils were immovable. She recovered from her general disease in two weeks, but her sight had remained weak, and she felt uncertain on walking.

“When she presented herself she was in good general health. Sight normal, but she showed a concentric limitation of her field of vision in both eyes. Her colour perception was normal. The ophthalmoscope showed a striking picture: *both optic disks white; the retinal vessels scant and very small, especially the arteries; the pupils were of normal size and mobility, and the eyeballs of normal tension, showing nothing unusual in external appearances and mobility.*”

While this may be called a typical case as far as it goes, it is by no means one of the worst kind, since the blindness may be total, and last for months. In fact it may take a couple of years before the sight is restored to the normal standard, and the contraction of the visual field may be permanent. The prognosis, as far as the return of central vision is concerned, is very good.

Knapp sums up the eye symptoms as follows: 1, diminution of the colour sense; 2, diminution of the light sense; 3, pupils irresponsive to light

during the total blindness; 4, anæsthesia of the cornea. He mentions again as a 5th symptom, impairment of hearing reaching to total deafness.

Thus we see that the eyes are the only conspicuous organs which intimate to us that great damage is being done or has already been done by this drug; and, when a physician has once become cognizant of the deleterious effect of the medication, if he has not stopped it long before, he will certainly do so immediately, and never give the same patient large doses of quinine again.

Salicylic acid may produce the same effect as quinine when it happens to be given to a patient whose personal idiosyncrasies forbid it, but such persons are by far less numerous than those who cannot tolerate quinine.

That it is really the quinine or salicylic acid which does the damage, and not the diseases for which they are given, may be concluded from the experiments of Kirchner in Würzburg. He gave animals 1–3 grammes of these drugs, and found after a lapse of three or four days, on post-mortem examination, that there were hyperæmia and hemorrhages in the tympanic cavity (middle ear). Also, in the labyrinth. Numerous hyperæmic conditions with reddish colouring of the endo- and perilymph existed. He did not state whether he examined the eyes or not; but pathological conditions can certainly be suspected in these organs *a priori*, in connection with the ear lesions.

The foregoing ought certainly to be enough to demonstrate the importance of the condition of the eyes to the general practitioner, in quinine and salicylic acid poisoning. So much for the ophthalmoscope. While there are many other conditions of importance which are furnished us by this instrument, we will let the above suffice for our purpose, and pass on to other diseases where we need the help of no instrument.

II.—THE RELATION OF EXTERNAL EYE DISEASES TO THE GENERAL SYSTEM, OR WHERE THE DIAGNOSIS CAN BE MADE WITHOUT INSTRUMENTS.

Locations of tumours, exudations, clots, etc., in the brain can easily be made in many instances from an examination of the eyes, if we keep in mind a few facts which we learn from anatomy. Such localizations are determined from an examination of the field of vision. For fear that such an examination may not be familiar to some, we will describe the simplest, as well as one of the best ways of making it, and also of recording it for future reference. Place the patient near a blackboard on the wall (say eighteen inches or two feet away) and direct him to look steadily at a chalk mark which will be made on the board in front of him. Only the eye which is to be examined should be allowed to remain open; close the other by placing a pocket-handkerchief over it. Take a piece of white chalk, and approach it from the periphery towards the spot which he was

directed to look at, and request him to say when he first sees it. As soon as he does, make a mark on the board with the chalk. In the same way, bring it from above, from below, the right, the left, and all intermediate directions, making a mark at the moment the chalk comes into view. If we now draw a line through all of the points thus formed, this line will map out the periphery of the field of vision of the eye examined. Examine the other eye in the same way, since only the conditions of the two eyes when taken together will enable us to locate a lesion in the brain.

The first anatomical point to be remembered is that in all animals having what is termed binocular fixation, or, that can direct both of their eyes to the same point at the same time, there is a more or less complete semi-decussation of the optic nerve fibres at the optic chiasm in the region of the sella tursica at the base of the brain. The second point is that in semi-decussation, the decussating fibres form the inner half of each optic nerve tract. As a direct result of this, we find that the nasal half of each retina is supplied by decussating fibres up to a vertical line running through the points of distinct vision, the foveæ centrales. The third and only remaining point to be remembered is that we see an object on our right side with the left side of the retina and on the left side with the right side of the retina.

To locate a brain lesion by means of the defects it produces in the field or fields of vision, suppose, for instance, that we examine a patient in whom we suspect such a brain trouble and find that the nasal side of his right retina is blind, that is, he does not see the chalk on the right side. In the same way on examining the left eye, the temporal half of the retina is found to be blind. The only possible place for the lesion would be in the left hemisphere, and behind the chiasm.

The reason of this is to be readily explained, viz., since only the nasal side of the right eye is blind, and the optic nerve fibres which supply the nasal sides of the retina always decussate, only the decussating nerve fibres of this eye are affected and consequently the lesion must be on the other, or left side of the brain. When we examined the left eye, we found that only the temporal half of the retina was blind, and since this half is supplied by optic nerve fibres which do not decussate, the lesion must also be on the left side of the brain, which agrees with the examination of the other eye.

If both eyes are totally blind the lesion will be most probably found to have destroyed the optic chiasm, or so extensive as to have involved the whole base of the brain.

If only one eye is totally blind the lesion must be in front of the chiasm for obvious reasons.

There is one very peculiar condition in the brain which leads to such defects in the field of vision as would be quite difficult to explain, unless

attention was directed to a certain anatomical arrangement of the bloodvessels in the circle of Willis. Suppose a patient was blind in both outer halves of his retina—the temporal of the right and also the temporal of the left eye. We know that these outer halves are supplied by optic nerve-fibres which do not decussate, and therefore to make both of these halves blind at the same time there must be compression on the outer parts of each optic nerve tract. Such a lesion could not be *behind* the chiasm, for if it affected both optic nerves there, both eyes would be totally blind. It could not be *in front* of the chiasm for the same reason.

It must, therefore, *be at the chiasm*. We find such a condition in an atheromatous degeneration of the walls of the bloodvessels which form the circle of Willis, a circumstance which was first pointed out by Dr. Knapp, of New York.

There is another very peculiar defect in the fields of vision possible, where both *nasal halves* of the retina are made blind. This too must come from a lesion at the chiasm, but *between the optic nerves*, since only at this place do we find the nerve tracts close enough together to be affected by a tumour, unless it involves an extensive area. If we remember that the infundibulum passes in between the nerves at this place, and the tuber cinereum is close at hand, we easily recognize that any tumefaction of these tissues may render the fibres of the inner halves of each optic nerve incapable of transmitting impressions to the brain, and the corresponding halves of the retina will be blind.

Ranney has made a diagram in his "Applied Anatomy of the Nervous System," which may be of assistance in the above localizations. While it is not exactly correct in details, it is still serviceable. It is only intended, however, to be diagrammatic.

While we have the study of the visual fields under consideration we may mention some other diseases which produce peculiar defects.

Atrophy of the optic nerve produces a concentric limitation of the visual field in the periphery, with the peculiarity that the boundary line is very irregular or zigzag.

Retinitis pigmentosa, or pigmented degeneration of the outer layers of the retina, produces a peripheric concentric limitation, with a very regular boundary. In advanced cases vision is limited to a very small central part of the retina, and after this total blindness occurs. It is a progressive disease usually found in children where there has been a too close intermarriage of their parents. These patients generally have pigment spots in the retina which resemble the shape of a bone corpuscle. They also complain of not being able to see at all after sunset (night blindness). This symptom, taken in connection with the peculiar visual field, is sufficient to diagnose the disease even if there is no pigment to be seen in the retina. No treatment will cure it.

Glaucoma produces a defect in the visual field on one side, but later it may resemble that of retinitis pigmentosa. In this condition there is generally a deep excavation of the optic nerve entrance, and the patients do not complain of night blindness. This disease is nearly always curable by an iridectomy or a sclerotomy, provided the operation is done early enough. Every doctor ought to be able to do this one eye operation, since it may be that his patient cannot reach a specialist until it is too late to do him any good. As a further indication of this disease we all know that the eyeball is very hard, and the cornea is anæsthetic. Acute glaucoma is sometimes cured by dropping a one per cent. solution of eserine into the eye. We may mention that there are two kinds of glaucoma in which an operation should seldom be undertaken, viz., 1, glaucoma in very young people; and, 2, where there are hemorrhages in the retina—"hemorrhagic glaucoma." The defect in the field of vision is also progressive in this disease.

Detachment of the retina produces a defect in the visual field corresponding in shape to the extent of the retinal detachment.

Embolism of one of the lower branches of the central artery of the retina will produce a defect in the visual field over the whole extent of retina supplied by such artery.

Exudations and *atrophic spots* in the choroid may produce defect in the field of vision corresponding to their situation. These are generally stationary, unless the exudation gravitates.

Disturbances of circulation in the brain may produce a peculiar defect in the visual field. It is generally on one side of the retina; commences at the centre and gradually passes towards the periphery; lasting from a few minutes to a few hours. The boundary of this defect is coloured like a rainbow. After it passes off (since it is only temporary) an intense headache generally sets in, lasting for several hours. There is no distinct brain lesion in connection with this form of defect, nor is there any known medication that will control it.

There are various causes which may produce local defects, such as a *coloboma* (congenital defect) in the lower part of the retina and choroid; but all of these are more or less stationary.

As a general rule we may say that those diseases which produce blindness in the periphery of the field of vision are progressive, and the blindness will become total; whereas if the defect is central, that is, in the posterior parts of the retina only, there is no reason why it should ever increase to any alarming extent. A knowledge of this latter fact always affords the greatest comfort to the patient.

Prof. O. Becker, of Heidelberg, in summing up an extensive treatise on the relation of eye troubles to the localization of cerebral disease states:—

"1. In cerebral disease, the eye affection is always on both sides. 2. Optic neuritis, or neuro-retinitis, alone does not prove the existence of central disease. 3. In primary atrophy (of the optic nerve) we can recognize its tabetic nature by the shape of the visual field. 4. In hemianopsia (blindness of one-half of the retina, or the condition which we have just been considering) we can also, without atrophy, accurately localize the central lesion. 5. There are visual centres in the cortex of both occipital lobes. 6. We obtain important clues for localization by closely studying the muscle symptoms."

As an instance of localization from the muscle symptoms we may refer to Wernicke's case (*Archiv. of Ophth.*) viz., a tumour in the brain with symptoms of paralysis of the right abducens, and paralysis of the left internal rectus muscles. Double-sided optic neuritis, sight normal (?). Later paresis of the left abducens and right internal rectus muscles (paresis of the associated lateral movement). Cured by 6 gramme doses of iodide of potash.

From anatomical considerations, readily at hand, the diagnosis must be gummy tumour of the pons.

So much for the visual field. The ease and rapidity with which localization of tumours in the brain are affected, depend, not upon the conditions of the eyes, since these are well defined, but rather upon the personal equation of the examiner.

Diabetes.—If we find a cataract in the eyes of young people, whose origin cannot be traced to an injury, we must always examine the urine, since diabetes is most frequently the cause of such eye troubles. The cataract develops rapidly, and is of a whitish colour. It is also soft. This disease produces other eye troubles which we need not mention here.

Intra-ocular Tumours.—While we are considering tumours we may as well look into what local intra-ocular tumours teach us in general medicine. I refer to the various forms of intra-ocular sarcomata, since this is the only kind of cancerous growth that happens within the eye. In past years pathologists have claimed a peculiar nature for the tumour known as glioma of the retina, but to-day we consider it as simply a sarcoma of the connective tissue of nerves. This kind of sarcoma and sarcoma of some part of the uveal tract (iris, ciliary body, and choroid) are all that will interest the general practitioner; in fact, they are the only true tumours which affect the inner parts of the eye, except occasionally myomata, gummatous affections, and a few other innocent local hypertrophic conditions. It is true that cysts of the various contents of the eye may happen, but they are nearly always of traumatic origin.

Sarcomata in the eye teach us this important fact. A fact, indeed, upon which too much stress cannot be placed, viz., that in the beginning cancers are purely local affections, and if they be removed by taking away the eyeball at once, they never return. Ophthalmology has done the important service of demonstrating conclusively the principle first laid down by Virchow, that all cancerous affections of the body are first local affec-

tions, but afterward spread to the general system by the various processes of metastasis, direct continuation, etc.

The only point to be observed in the diagnosis of one of these intra-ocular cancers is to notice that there is some abnormal growth in the background of the eye, and then watch the ocular tension, viz., whether the eye gets hard or soft. To a person not particularly skilled in eye examinations an extensive detachment of the retina from the choroid may resemble a sarcoma of the retina (glioma) since they are both more or less of a white colour. The distinction which any one can observe is that in retinal detachments the eyeball either remains of the same hardness as the other eye or gets softer, whereas, a tumour of the retina makes the eyeball harder, or produces, sooner or later, what oculists call glaucomatous tension. A white sarcoma of the choroid will do the same thing; but since choroidal tumours occur in a tissue which is almost always of a dark colour from the choroidal pigment, they are generally reddish, brown or black. A further point in diagnosis between retinal and choroidal sarcoma is that the retinal variety always happens in children, whereas the choroidal variety generally occurs in adults. However, a distinctive diagnosis is of no great importance, since the treatment is the same in both. I would make a few suggestions as to what a physician should do when he meets with one of these tumours, since his action in the great majority of cases will determine the length of life of the patient.

If a sarcoma is not taken out with the entire eyeball (and that immediately) the cancer will most certainly pass into the bones of the orbit, and subsequently may affect the brain, liver, and the various other organs of the body, where it means certain death. If, on the contrary, the eyeball has been removed before the tumour has begun to spread, there is reason to believe that the disease is radically cured. The same may be said of sarcoma of the retina (glioma).

If the eyeball has been at once removed and the patient has gone on for *two years* without any symptoms of complication, he may be considered cured. If the disease comes back in the orbit the whole contents of this space must be taken away to the bone, with the hope that it has extended no further than the orbital contents. It is, however, a sad thing to see the disease reappearing in any part of the body after an attempt has been made to remove a choroidal sarcoma by extirpation of the eyeball.

Quite an amount of care and skill in diagnosis is requisite in this particular form of intra-ocular cancer.

There are a few cases of glioma of the retina or fungoid growth, as it is sometimes called, on record, which suppurated and cured themselves by perforating the eye continually, but they are very rare. The great majority of children suffering from this affection certainly die if the eyeball is not removed as quickly as possible after the diagnosis is made. They

either perforate the eye posteriorly and go into the orbit and thence to the bones of the skull and brain, or they are transmitted directly to the cerebral contents along the optic nerve, as in the case which I reported in the *Archives of Ophthalmology*, vol. x.

In both of these forms of cancer the anterior part of the eye is perfectly clear; attention being called to their existence only by examining the posterior parts of the eye, or by a peculiar brownish reflex in sarcoma melanoticum of the choroid, or a whitish one in white sarcoma of the same ocular coat or glioma (sarcoma) of the retina.

Tumours of the Orbit.—There are various other tumours which happen about the eye. As periosteal sarcoma of some of the bones of the orbit; adenoma or cylindroma of the lachrymal gland; ivory exostosis from the frontal sinus, etc.; but these make themselves known either by dislocating the eyeballs or by some prominence of their surrounding parts. These are not specially interesting to the general practitioner, although many of them produce death if not extirpated.

Pulsating Exophthalmus.—While we are speaking of tumours which affect the eye, we have still another to mention; the most peculiar and interesting of all. It is that which is known under the name of pulsating exophthalmus (protrusion of the eyeball).

There are about 125 such cases on record, and they all give a similar history. The typical condition is as follows: the patient comes to a doctor, with one, or sometimes both of his eyes protruding, and on palpation and auscultation there is a pulsation to be made out and a bruit to be heard in the eye, and over a certain area of the head surrounding it. Such patients almost always give a history of having had a fall on the head some time before, which produced the symptoms, at the time or later. *They are all traumatic.* The peculiarity of the condition consists in the fact, that notwithstanding the important eye symptoms, the disease has nothing to do with the eye, nor can any amount of eye treatment affect it in the least. All such conditions result from a rupture of the internal carotid into the cavernous sinus of the brain. As before remarked, only the eye on the side of the rupture is generally affected, but it sometimes happens that the other eye also becomes prominent and pulsates.

The only treatment which is rational in such cases is ligation of the common carotid on the injured side, and if this does not do away with the unpleasantness, ligation of both of the carotids (right and left sides). Sometimes even this does not do away with the disease, but it would be well, before undertaking these operations to try what the effect of ligation would be by pressing upon one or both of the arteries and listening if the bruit disappears or not. If it does, ligation is certainly desirable.

Sometimes we meet with a pulsating vascular tumour behind the eye, in the orbit, which is congenital, but is hardly to be mistaken for the

above exophthalmus. The proper treatment in such cases is to cut it out entirely. The operation offers some difficulties and should generally be done by a specialist of the highest standing, since a great amount of experience is required in operating behind the eye, to avoid cutting some of the muscles and nerves which are so numerous in this vicinity.

In the first kind of exophthalmus the eye symptoms may be almost the only ones which can point out the real condition of affairs. They point to a disease far remote from the eye itself, which can be cured in most cases by an operation which any surgeon can do. The eye symptoms become especially important to the general practitioner, since they lead him directly to the seat of rupture of the carotid into the cavernous sinus, and furthermore tell him how to cure his patient.

There has been a recent, very interesting, case of pulsating protrusion of the eyes (exophthalmus) published by Nieden, which certainly deserves to be mentioned here. A woman had had a fall on the back of her head in her fourth month of pregnancy. The fall did not affect her very greatly in any way at the time with the exception that she was unconscious for a day or so. At full term she was delivered of a healthy child, but just after this event her right eye began to protrude and then her left. The pulsation and noises in her head were not entirely done away with by compression of the common carotids in the neck, but they were very much improved. She and her husband were consequently shown how to make the compression with the finger,¹ and told to keep it up for several hours every day. The explanation of the case was that at the time of the fall the rupture was small, but the straining, concomitant with the process of labour, enlarged it and brought on the condition which we usually find in the beginning. Where such cases are met with in the practice of obstetrics the cause can be known from the foregoing.

Basedow's Disease.—Next in order comes the peculiar eye condition which is met with in Basedow's disease (morbus Basedowii). This too is a disease in which the eye symptoms may help the doctor very materially in his diagnosis, while the original disease has nothing to do with the eye, but is an affection of the heart.

The patient generally comes with both eyes protruding; but there is no pulsation or noise in the head. The eyes have a peculiar stare; and one of the striking conditions is that the lower lids do not cover the lower white parts of the eye (visus horidus). If the heart is examined in such a case, there will be a more or less conspicuous valvular lesion—the knowledge of which would be of great importance to the doctor in his treatment and prognosis.

¹ My friend, Dr. Corning, of this city, has recently written a monograph on compression of the carotids, and devised some very nice instruments for carrying it out.

The Pupils.—The conditions of the pupils sometimes speak volumes to the physician.¹ Conspicuous among the general diseases which their conditions show is tabes dorsalis. We all know that there are two centres for the action of the pupil, one which controls it in what is known as its accommodation action, and another which resides over its reaction to light. In tabes dorsalis, or sclerosis of the spinal cord, the light centre is affected, whereas that for accommodation remains free. Therefore when a bright light is thrown into the eye, the pupils are very small, but do not change their size in the least, as will constantly be the case when a bright light is thrown into the normal eye, however small the pupil may be already. If, on the contrary, we direct the patient to look at the end of our finger, and approach it close to the eye, the pupils will get smaller in tabes dorsalis, as they do in the normal eye. (This is called reaction to accommodation.)

Under this condition the pupils are known as Robertson's pupils, and when present, combined with loss of sexual appetite and weakness of the

¹ To show how important the size and conditions of the pupils are, we will quote from the quarterly report on ophthalmology in the *New York Medical Journal and Obstetrical Review*, July, 1881, p. 93, the following conclusions of Raehlmann:—

"1. If the illuminated pupil does not react to light, while the other pupil does, though not illuminated, the first optic nerve still retains its conducting power, and the failure of the pupil to react is due to a unilateral paralysis of the pupillary branch of the corresponding oculo-motorius, or to some affection of the iris. 2. If the pupil react to light, in spite of complete blindness, the cause of the latter is beyond the corpora-quadrigemina. 3. If both pupils react during convergence, both motor oculi nerves perform their function as regards the pupil. 4. If both pupils fail to react to light, either directly or sympathetically, while they contract during convergence, and if there is a certain amount of vision in both eyes, there is some obstruction to conduction in the fibres between the nucleus of the oculo-motorius and the tubercula quadrigemina. 5. In physically weak nervous persons and in maniacal patients very wide pupils are so often observed, that narrow pupils are regarded as an ominous symptom of approaching paralysis. A rhythmical change in the pupils is also observed in these cases, independent of the influx of light or of the act of convergence. 6. Narrow pupils are peculiar to all diseases which cause a diminution of the cortical function, especially paralytic dementia. 7. Myosis is especially frequent in diseases of the spinal cord and medulla oblongata; in tabes the narrow pupil is immovable to light, but reacts to convergence. 8. Irritation of the sympathetic in its peripheral course, or of its cervical ganglia, causes dilatation of the pupils. 9. Dilated pupils are a very characteristic symptom of impeded respiration from the action of carbonic acid upon the medulla. Contraction of the pupils shows that the highest degree of narcosis has been reached. 10. The pupils are dilated in pressure upon the brain, in brain tremors with choked disk, in chronic hydrocephalus, in hemorrhages within the cavity of the skull, and in simple distension of the cerebral vessels. 11. Difference in the size of the normally movable pupils points to an irregular innervation of the sympathetic, due to an irritation, either in its peripheral course or in the central connections in the brain and spinal cord. Mydriasis (wide pupil) of one eye, with movable pupil, is a suspicious symptom, pointing to a threatening brain disease, while without a movable pupil, it has no special significance."

grip of the hand, tabes dorsalis may be diagnosticated without the usual staggering gait. Here, again, the eye draws the attention of the general practitioner to a disease remote from it, which may be either cured or very much improved by appropriate treatment, whereas, if not so treated, grave consequences may be expected.

Syphilis.—There are various eye diseases which are brought about by syphilis, which may be the only symptom of the systemic contamination. The most conspicuous of these is a gummy tumour of the iris. If a patient comes with a part of his conjunctiva congested (the congestion occupying a band of this membrane extending from the margin of the cornea back around the eyeball), there are three conditions which may be looked for : 1, a foreign body in the cornea ; 2, a small ulcer like a phlyctenular ; 3, syphilitic iritis. Nos. 1 and 2 are easily detected by inspection, but if it is to turn out No. 3, in a little while a small yellow tumour or elevation will appear in the iris very close to the margin of the pupil. When such a tumour has made its appearance, even without any other symptom, we need not ask the patient if he has had a chancre, but *when* he had it. In fact we need not ask him any question at all, but simply put him or her under a vigorous mercurial treatment. Syphilitic iritis means energetic treatment, and the sooner the patient is brought under the effects of mercury the more damage we avoid. It does not make any difference whether he is salivated or not ; but when salivation does happen it is often not the fault of the mercury but of the doctor. As the old saying goes, a gumma in the iris means “five minutes with Venus and five months with Mercury.” It is a growing opinion in the profession that syphilis is radically curable. Be this as it may, syphilitic iritis is always curable under proper treatment. The recognized way of treating this form of eye disease is hypodermic injections of bichloride, combined with inunctions of blue ointment. Calomel, combined with a little opium, may also be used at the same time, and if the teeth are properly cleansed every hour with chlorate of potash there is no reason why salivation should occur. It is, however, better to stop treatment as soon as the peculiar mercurial odour of the breath is noticed.

Ocular Paresis.—There are a series of affections of the external muscles of the eye which are syphilitic in their nature. Paralysis or paresis is the general result. A paresis may come from a cold ; but syphilis may also be suspected. If the patient has lost his hair just before the paresis, it looks very suspicious, and a little mercury may cure the muscular affection.

Just now another symptom occurs to me which might entirely mislead a doctor in his diagnosis. I refer to the position of the head in paresis of any one of the extra-ocular muscles. We know that it is very disagreeable to any one to have double images ; viz., two images of one and the same

object. This always happens when one particular muscle of the eye is weak, when the physiological action of that muscle is necessary to bring the two eyes to bear on the same object at the same time.

A patient will try in every conceivable way to get rid of these double images by fusing them into one, and when he can do it by turning his head in any particular direction he soon learns to place his head in the proper position to accomplish his purpose.

If any of the external muscles are weakened by any cause, the person will turn his head in such a direction as will supply a certain loss of power of the weak muscle by the corresponding position of his head; that is, he will turn his chin in the direction of the line of action of the muscle which is suffering from paresis.¹ If the external rectus of his left eye is weak, he will turn his head toward the left side, so that he may shift the responsibility of single vision upon the internal rectus of the same eye, by making it do so much more work than it would have to do if the head was held in the usual direction, and the rectus externus muscle had to do the work of binocular fixation.

This may not be understood at first, but if we remember that the action of the left external rectus is to pull the eyeball directly outward, if we turn the head to the left, the optical axis is placed in the same position as it would have been had the head remained stationary and the eye moved.

Therefore, if a person walks with his head in any peculiar position, the particular ocular muscle towards which he turns his chin is weak. The chin is mentioned, since it covers the case of the oblique muscles also. The lameness may come from a tumour, it may come from a cold, but it is very frequently the result of syphilis, and a careful history should be arrived at.

Again, the eyebrows are a favourite place for gummy nodules to appear.

Inequality of the size of the pupils is also a result of syphilis in a large percentage of cases.

There is another form of eye trouble which may help the physician materially in diagnosis, viz:—

Specific Choroiditis.—A patient came to me some time ago, and complained that when he looked at anything there was a cloud before his eye which made everything dim. I looked into his eyes with the ophthalmoscope, and the only thing I could distinguish was that the picture of the background of the eye was not as sharply defined as it should be. The cornea, lens, and anterior part of the vitreous humour were perfectly clear, so the veil must have been in the posterior part of the vitreous. The retina seemed to be normal as far as could be made out through the opacity. On careful examination I could distinguish that the opacity was very finely punctated, and seemed to move about with the motions of the eye—

¹ Very nicely given in Ranney's "Applied Anatomy of the Nervous System," New York, 1881.

ball. I asked him if the veil of which he complained was fixed, or if it seemed to move when he moved his eyes. He told me that when he held his eyes steady for a time the veil was stationary, but when he suddenly moved them from this position the opacity followed like a cloud of dust, and passed the point at which he then fixed his gaze and banked itself up, as it were, to one side of his field of vision. I asked him if he had had syphilis, and he said he had not; but I was firmly convinced that he had. About a week or ten days after this there was a slight neuro-retinitis in his left eye, but none in his right. Some time after I had to treat him for an ordinary spongy iritis, when the diagnosis was certain, since the occurrence of spongy iritis (made known by a gelatinous exudation into the pupil and anterior chamber) never happens except after traumatic influences (operations, etc.) or constitutional syphilis. I told him that his eye was in no particular danger if he would submit to a severe treatment. Having put him in bed in a dark room, and given him mercurial inunction twice daily, combined with biniodide pills, to the extent of $\frac{1}{10}$ gr. three times daily, with atropine to be dropped into his eye every two hours, and leeches to his temple (since his pain was severe), he made a complete recovery from his eye trouble in the usual time of about six weeks.

Having often witnessed the good effects of an after-treatment of Zitmann's decoction, while resident surgeon at the New York Ophthalmic and Aural Institute, I ordered him to take one bottle of it every day for two weeks, and after that to take a mixed treatment of biniodide of mercury $\frac{1}{30}$ gr. and iodide of potash 10 grs. three times daily. Since then he has had no unpleasant symptoms.

Had it not been for the eyes no one would ever have known that he had been contaminated; for there was no other trace of specific disease about his whole body. It would have gone on until some of his vital organs would have become affected, which would certainly have been more dangerous to him than his eye disease. The case I have prepared more fully for publication elsewhere, since it presented other features which were more interesting to a specialist. I relate so much of it here, since the peculiar dust-like opacity in the vitreous was the only symptom about his whole system which could have led to a correct diagnosis; and it appeared some weeks before the spongy iritis. There must have been a slight neuro-retinitis or choroiditis at the time, but the opacity rendered its diagnosis very uncertain. This is by no means a new observation. I would remark that $\frac{1}{3}$ of a grain of biniodide per diem is quite a large dose, but I considered it necessary, and it worked in a charming manner.

The only other eye symptom of a specific nature which I need mention is the *parenchymatous inflammation of the cornea*, which is due to congenital syphilis. This generally comes on in childhood, or at the age of puberty. It is sometimes called "scrofulous keratitis," but I prefer to consider it a result of a congenital syphilitic contamination. It is generally combined with a notched condition of the front teeth (Hutchinson). These two symptoms may be the only ones which help in the diagnosis, and are, therefore, of great interest to the general practitioner. So much for syphilitic eye disease.

Asthenopia.—There is another condition of the eyes, the result of a local affection, which, if not understood, will completely baffle all attempts at relief. In fact, unless the physician recognizes it, all of his medication would be worse than useless. I refer to asthenopia from some anomaly of refraction (great pain in the eyes and head, due to far-sightedness or other abnormal refractive condition of the eye). I remember the case of one of our most talented physicians of this city, one with a very large, general practice, and a professor in one of our medical colleges, who was absolutely incapacitated for work by such a condition of his eyes. He was a perfect slave for years to a most excruciating kind of headache, having had to lie in bed for days at a time. The peculiarity of the condition is, that a person so affected can see perfectly well in the distance, and also near objects, for a short time; and, if his attention is not specially called to his eyes, he may never know that they are at fault, as was the case with this patient.

All medication for the intense headache of these subjects will be perfectly useless, unless the eye trouble is done away with by making the patient use the proper glasses. He must be tried and suited with biconvex spherical glasses, and if the glasses have been well chosen, all of the subjective symptoms will disappear as if by magic.

This is purely an eye trouble which may completely mislead in making a diagnosis; and also one which can always be completely cured by the proper treatment. If there is no specialist at hand, the patient may pick out such glasses for himself as will give him *the most relief when reading for a long time.*

There is another kind of asthenopia (pain in the eyes and head from muscular fatigue) which, however, demands the intervention of an oculist. This is where one of the internal recti muscles is by nature not strong enough to do the constant work required of it when the two eyes are focused to a near point. The muscle, being too weak, becomes tired, and pain occurs in the eyes, or the eye to which the muscle belongs turns outward, when the patient will see double. This is either to be corrected with *prismatic* glasses, or by an operation; but this particular condition requires the greatest nicety in treatment, so that the patient had better be sent at once to a specialist.

Uterine Diseases.—There is a large class of diseases of the urino-genital organs which produce changes in the eyes, and in some cases may be the only symptoms which the physician can make out without examining the uterus. In fact their presence may point out the uterine trouble.

Only the day before yesterday I was asked to see a young lady in the practice of Dr. Bagley, of this city, which may be interesting to relate in this connection.

The girl was a Hungarian, and, as before stated, 19 years of age; strongly developed, and apparently the picture of health.

She said she had menstruated but twice in her life and in these times her physiological hemorrhage only lasted a half week. This occurred about two years ago; but since that time she was made very miserable every month for a few days, suffering from *most intense headache, combined with anæsthesia of her arms and legs*. For the last three monthly exacerbations she had had an attack of facial erysipelas which lasted about one week each time. She stated that her face got very hot and red, the headache being in the back of her head. At these times she would get completely blind for minutes at a time, the blind attacks coming on many times every day. The light was not particularly disagreeable to her, nor did she suffer any great pain in her eyes.

Of course such symptoms would have led me to make an examination of her sexual organs, but this had already been done by Dr. Bagley. The vagina was completely closed by a membranous septum across the external orifice just behind the labia minora. This septum was continuous, so that if there had been an external flow (as she said there had been twice in her life) such a thing was now impossible, since there was no perforation for the escape of the menstrual fluid.

The probability is that this woman has been menstruating regularly, but the blood has been retained in the vagina and uterus. She said that she had at times all kinds of pains and cramps about the lower part of the abdomen. An operation was agreed upon as is usual in such cases, but since it has not yet been done, we cannot say whether the eye symptoms were brought about simply by a retention of the blood or by an organic disease.

Mooren, of Düsseldorf, explains such cases as the result of engorgement of the uterine plexus, the plexus pampiniformis, and also the same condition of venous system of the ovaries, in fact, of all the pelvic venous vessels. Through their intimate and direct communication with the veins of the spinal column, this pathological condition is extended to the cerebral sinuses, where it produces a great variety of complex symptoms.

The pain in the head and face is to be explained by an irritation of the roots of the trigeminus; and the blindness by disturbances in the cortex of the occipital lobes where there are centres of vision according to many observers. The sight was good, and she had no special hyperæsthesia of the retina. Generally the eyes do not escape so easily; since, according to Mooren, a uterine trouble may produce an inflammatory process of any part of the eyes, or even lead to blindness from atrophy of the optic nerve.

This case would not have been of material advantage to a practitioner as far as the eye symptoms are concerned, since the uterine system was so clearly at fault that his attention would have been at once called to it, as was the physician's who had charge of the patient.

Not so with the next case. A woman came to my office about six weeks ago (April 18th, 1882), complaining of her eyes. She was of English extraction, of 35 years, had had two children, the youngest of which was 8 years old. She said that she could not see as well as she used to, and wanted me to select a pair of glasses for her. Her sight was reduced to about one-half of what it should be. She was near-sighted,

but I could not bring her sight up to the normal by any simple glass or combination of glasses. (No astigmatism.) I then examined her retina and optic nerves with the ophthalmoscope and found that she had a hyperæmia of the background of the eye. The optic papilla (nerve entrance) was pink and its edges were slightly ill defined. I then asked her about her menstruation, and she told me that she had been irregular since she could remember, sometimes menstruating for two days and sometimes for a whole week. Again, her periods were irregular, frequently leaving five or six weeks between them.

I told her that no local medication would do her eyes any good until the uterus was put into proper working order, and advised her to consult a gynæcologist.

The pain, however, which is sometimes concomitant may entirely mislead the physician, unless he happens to examine the eyes. Such an ophthalmoscopic examination would be of great importance to a general practitioner, since the lady did not complain of her uterus; simply considering her irregularity as the penalty of being a woman. Mooren, having treated over one hundred thousand eye cases, has probably as much or more experience in eye troubles than any other living specialist. He has recently written a paper of some sixty pages, in the *Archives of Ophthalmology*, on the eye diseases in connection with uterine troubles. He cites a multitude of cases in which an examination of the eye led him to make a diagnosis of disease of the uterine system, some of them only complaining of their eye trouble. According to this paper all kinds of pelvic diseases can influence the brain directly and the eyes indirectly, from a simple parametritis to all forms of tumours of the uterus, and even prolapse of the rectum.

To demonstrate more fully the intimate connection of the uterine function with the condition of the eyes, this author gives cases of operations upon the eyes, which had gone without irritation for as long as fourteen days, when irritation immediately set in on the advent of a purely physiological menstruation.

He also gives illustrations where simple pustules on the outer genital organs, having extended to the mucous membrane of the vagina, produced hyperæsthesia of the retina, and great photophobia. Again, the simple introduction of a vaginal speculum, and its analogue masturbation, caused the same symptoms. In fact, any uterine irritation may cause a complex of eye symptoms which will completely baffle all the efforts of the physician to cure the eye disease, unless the uterus and its functions have been previously restored to their normal condition.

A complication of the eyes from uterine anomalies is very easily explained by the direct communication of the venous plexuses with the sinuses of the brain; but there are also reflex conditions in the eyes which we cannot account for with our present knowledge of physiology. At any rate, a thorough knowledge of the extent to which the eyes and their disease may be influenced by diseases of uterus and ovaries is indispensable

to a general practitioner, since the condition of the eyes may oftentimes be the only objective symptom which will enable him to arrive at a rational and scientific diagnosis. In fact, such considerations as we have briefly and, consequently, but imperfectly given in the foregoing pages, bring us back to the time-honoured maxim, "Qui bene distinguit, bene medibitur."

156 MADISON AVENUE, New York City.

ARTICLE XIII.

ON ECHINOCOCCUS DISEASE IN AMERICA. By WILLIAM OSLER, M.D., M.R.C.P. Lond.; Professor of the Institutes of Medicine, McGill University; Lecturer on Helminthology, Montreal Veterinary College; Physician to the Montreal General Hospital.

THE accidental ingestion of the eggs of the tiny *Tania echinococcus* of the dog produces the most serious and fatal parasitic disease of man. The affection prevails extensively in certain countries, as Iceland and Australia, where the habits of the people or the relations of the canine host to man insure easy means of communication. In Europe the disease is not uncommon, and at any one of the larger clinics several examples are sure to occur during the session. So far as I know, the facts of its occurrence in America have not been investigated, and the object of this paper is to give an account of an inquiry into its prevalence. I was led to make this in connection with an annual course of lectures on the parasites of man and the domestic animals which I give to medical and veterinary students. I could not ascertain, from any writings at my command, whether the disease was common on this continent or not. In this section of the country it is rarely met with, and in the inspection of over 800 bodies only three instances have been found.

The following cases, 61 in number, have been collected from the museums, journals, transactions, and from private sources. The first three cases came under my own observation.

CASE 1. Single cyst in liver. The specimen was found in a subject provided for the class in operative surgery during the summer session of McGill Medical Faculty, in 1877. The man had been a tramp, and died in the hospital of pneumonia. No information could be obtained from him as to his nationality or past history. The cyst was the size of a large orange, and occupied the posterior part of the right lobe, in close contact with the diaphragm. These were daughter and granddaughter cyst, and the scolices were well developed. *Montreal General Hospital Reports*, vol. i. 1880, p. 314.

CASE 2. Cysts in liver, spleen, stomach, omentum, mesentery, and pelvis. An Italian, aged about 35, a resident of the city for four years. Died in the Hôtel Dieu on May 1st, 1880, after an illness of about six months. The chief

symptoms were enlargement of liver and spleen, with nodular tumours in abdomen, irregular fever, sweats, and emaciation. Autopsy revealed the following: Liver enlarged and closely matted to the stomach and omentum. Spleen projected beyond the costal border and reached nearly to the crest of the ilium. Attached to the root of the mesentery by a narrow pedicle was a large pear-shaped cyst the size of the fist. Omentum contained several small ones and the parietal peritoneum five or six, one much flattened and with four subdivisions. A large cyst, the size of a cocoa-nut, filled the entire pelvis and pushed up the bladder to a level with the navel and compressed it against the anterior abdominal wall. The liver was greatly enlarged but retained its shape; the under surface and anterior edge were closely united to the stomach and colon. The left lobe was as large as the right and contained two cysts, one in the anterior and the other in the posterior part; both contained pus and shreds of echinococcus membrane. The anterior cyst had perforated the stomach in two places and the duodenum in one; the orifices having smooth firm edges. There was a large cyst at the fundus of the stomach, completely within the wall and covered by a very thin mucosa. The spleen presented three small vesicles at the hilus, and contained a single cyst the size of a cocoa-nut everywhere inclosed by spleen tissue. (Unpublished.)

CASE 3. Obsolete cyst in liver. Englishwoman, aged about 40; dead of pneumonia. Hooklets in the cretaceous débris. (Unpublished.)

CASE 4. Cyst in liver. No history. Specimen, with those from Cases 1, 2, and 3 in the Museum of the McGill Medical School. (Unpublished.)

CASE 5. Cyst in liver. An Icelandic emigrant woman, patient of Dr. Buchan, of Toronto. Cured by a single aspiration. Scolices in the fluid. (Unpublished.)

CASE 6. Cysts in liver and pelvis. Dissecting room subject; female; Toronto School of Medicine. Two cysts in the liver, one of which had ruptured into the intestine. A third was attached to the walls of the pelvis. (Unpublished. Dr. I. H. Cameron.)

CASE 7. Cyst of liver. Young Englishwoman, patient of Dr. Cameron, of Toronto, who also furnished the notes of 5 and 6. (Unpublished.)

CASE 8. Obsolete cyst of liver. Englishman; inmate of Kingston Insane Asylum for 17 years. *Canadian Journal of Med. Sciences*, Aug. 1882.

CASE 9. Suppurating cyst of liver, bursting into lung; cyst in spleen. Englishman, aged 29, resident of Canada for five years. Dr. Black, of Uxbridge, Ont. (Unpublished.)

CASE 10. Echinococci in brain. No. 566 Army Medical Museum, Washington.

CASE 11. Cyst in anterior edge of liver. From a mulatto. No. 651 Army Medical Museum, Washington.

CASE 12. Cysts in lung, spleen, and bladder. Pole, aged 40. Remarkable history. *New York Medical Record*, Sept. 25, 1880. Nos. 1342-43-44 Army Medical Museum.

CASE 13. Several cysts from liver. Jar labelled P. C. 46, vol. i. Museum of University of Pennsylvania, G. B. Wood Cabinet.

CASE 14. Hydatid cyst of spleen. Same collection.

CASE 15. Liver with a cyst, probably hydatid. Same collection.

CASE 16. Cyst in abdominal wall. From an English sailor lad. Wistar-Horner collection, University of Pennsylvania. I did not see this specimen, but Prof. Leidy told me it was in the collection. He stated also that Nos. 13, 14, and 15 may not be American cases, as he was under the impression that the specimens had been imported from Paris by Dr. Wood.

CASE 17. Cyst in liver. Museum of the Pennsylvania Hospital, No. 1382⁵⁰.

CASE 18. Multiple cysts in liver. From a French lad. Same collection, No. 1382⁵⁵.

CASE 19. Cyst of liver. From an Italian, aged 55. Same collection.

CASE 20. Cyst in liver. New York Hospital Museum, No. 932.

CASE 21. Multiple echinococci; one in abdominal wall, one on surface of liver, a third loose in peritoneal cavity, and a fourth in pelvis. No history. Same collection, Nos. 933-34-35-36-37.

CASE 22. Single cyst in liver. Bellevue Hospital Museum, No. 865.

CASE 23. Cysts in liver. Same collection, No. 866.

CASE 24. Cyst of liver—suppurating. Same collection, No. 867.

CASE 25. Large cyst of liver. Museum of University of New York (Prof. Loomis).

CASE 26. Cyst in liver. Warren Anatomical Museum, Harvard, No. 2381.

CASE 27. Echinococci discharged from intestine. Same collection, No. 3773.

CASE 28. Cavity at apex of left lung containing echinococci. Same collection, No. 2156.

CASE 29. Cyst in liver, from a sailor dead of phthisis. Same collection, No. 3871.

CASE 30. Cyst in liver. Dr. Jacobi. *Transactions of New York Pathological Society*, vol. iii.

CASE 31. Cysts in peritoneum, in gastro-splenic epiploon, attached to spleen and liver, and one in the pelvis. Woman, æt. 29. Dr. Metcalfe. *Ibid.*

CASE 32. Echinococcus of the common bile-duct. Old man, with enlarged liver and deeply jaundiced. Common duct blocked with a polypoid tumour the size of the thumb, which contained three echinococci. Dr. McCready. *Ibid.*

CASE 33. Cyst of liver. Man, æt. 38. Dr. Loomis. Perhaps the specimen in museum of University of New York. *Ibid.*

CASE 34. Cyst in region of liver. An Englishman, age not given. Passed four quarts of material containing echinococcus shreds; also vomiting some of them. Death from exhaustion. Dr. Keys. *Ibid.*

CASE 35. Cyst of right lobe of liver. Woman, aged 29. Opened by caustic and incision. Death. Dr. Jacobi. *Ibid.*

CASE 36. Two cysts in liver, right lobe. German, sailor. Dr. Cory. *Ibid.*

CASE 37. Cyst of anterior border of right lobe. Dr. Finnel. *Ibid.*

CASE 38. Cysts in liver. Opened by incision—recovery. Dr. Van Buren. *Ibid.*

CASE 39. Cyst in liver. Opened by caustic and incision—recovery. Dr. Alonzo Clark. *Ibid.*

CASE 40. Echinococci vomited. A woman, vomited at different times about a quart of echinococci, supposed to come from liver or omentum—recovery. Dr. Alonzo Clark. *Ibid.*

CASE 41. Cyst in liver; held two quarts of turbid fluid; hooks found in the sediment. Dr. McCready. *Ibid.*

CASE 42. Echinococci expectorated from the lungs. An Englishman, who had come from Honolulu. Dr. Bernays (Sen.), St. Louis, Mo. (Unpublished.)

CASE 43. Cyst of liver, which burst into the bowel. German woman. Dr. Bernays (Sen.), St. Louis, Mo. (Unpublished.)

CASE 44. Multilocular cyst of liver. A Bavarian, aged 39. Dr. Dean. *St. Louis Med. and Surg. Journal*, August, 1877.

CASE 45. Multilocular cyst of liver, from a negro woman. Dr. Dean. *Ibid.*

CASE 46. Cyst of liver. Man, aged 32. Dr. Tyson. *Trans. of Path. Society of Philadelphia*, vol. iv.

CASE 47. Echinococci of liver and pelvis. Frenchman, aged 32. Dr. Hutchinson. *Ibid.*

CASE 48. Tumour in right hypochondrium (liver) for several years. Expectoration of echinococci—recovery. Woman, aged 35. Dr. Minot. *Boston Med. and Surg. Journal*, vol. 61.

CASE 49. Echinococci passed per rectum. Woman, aged 29. Dr. Sherard (Mobile). *Med. and Surg. Reporter*, 1871.

CASE 50. Echinococci passed per rectum. Boy, aged 10. Abdominal tumour for some time. Symptoms of obstruction of the bowels. Recovery after the passage of a large number of echinococci. Dr. Simmons. *Pacific Med. and Surg. Journal*, 1864.

CASE 51. Cyst in gastro-hepatic omentum. Woman, in Bellevue Hospital. Symptoms—pain, jaundice, and peritonitis. Echinococcus cyst lay along the common duct and compressed it. Distension behind the site of pressure, and rupture of the duct. Dr. Polk. *Med. and Surg. Reporter*, vol. 42, 1880.

CASE 52. Echinococcus of brain. No history. Specimen in Cincinnati. Authority of Dr. Hyndman, Medical College of Ohio.

CASE 53. Cyst in liver. No history. Dr. Hyndman, of Cincinnati.

CASE 54.¹ Cyst in fascia of neck. Dr. Sands. *American Med. Times*, 1861.

CASE 55.¹ Echinococcus of lung. F. G. Smith. *North American Med.-Chir. Review*, 1858.

CASE 56.¹ Cyst in liver. J. E. Webber. *New York Med. Times*, 1853.

CASE 57. Cyst in tibia. F. W. Webster. *New England Journal of Med. and Surg.*, 1819.

CASE 58. Cysts in liver. E. Alexander. *Boston Med. and Surg. Journal*, 1838.

CASE 59. Cysts in liver; rupture into peritoneum. Man, aged 35. Dr. Gross. *Pathological Anatomy*, 2d edition, 1845, p. 662.

CASE 60. Cyst of liver.² Charity Hospital, New Orleans. Authority, Dr. H. V. Ogden.

CASE 61. Cyst in lung, cured by incision. Italian, aged 37. Dr. Fenger. *Am. Journal Med. Sciences*, Oct. 1881.

The distribution of the cysts throughout the organs of the body in this series of cases was as follows: Liver 44, spleen 4, peritoneum, omentum, and mesentery 7, pelvis 4, lung 5, brain 2, abdominal wall 2, stomach 1, bladder 1, subcutaneous 1, bones 1, in common bile-duct 1, discharged from intestines 5, vomited 2, expectorated 2.

This list, imperfect in many particulars, represents the available American cases of the disease. Doubtless there are many unrecorded instances; indeed, twelve or more of those here given have not been before published. It is evident that *echinococcus hominis* is a very rare affection in this country. Unfortunately we cannot say positively how many of these cases were truly American, *i. e.*, originated here, and how many were imported, but in sixteen it is stated that the patients were Europeans. In the majority the nationality was not given, but in all probability at least one-

¹ These three cases are quoted by Cobbold (Parasites, 1879), but Dr. Brigham, of the Boston Medical Library, could not confirm the references.

² I mislaid the notes kindly sent by Dr. Ogden, but, so far as I can remember, it occurred in a woman, a foreigner.

third of the cases were imported, leaving only about forty native cases. This immunity may be due either to scarcity of the adult worm or to the absence of conditions favourable to the infection of man. The *tænia echinococcus* is certainly a rare parasite. In some scores of dogs which I have examined during the past fifteen years I have never met with a specimen nor do I know of its detection by any American observer. Even in England, where the disease is tolerably common (some of the metropolitan museums have from twenty-five to thirty specimens of echinococci), Cobbold states that the only examples of this species that he knows of have been reared experimentally. That it is present in dogs in this country to a greater extent than we might suppose from the above facts is shown by the occurrence of echinococci in the lower animals. In casual visits to butcher stalls and to the shambles I have obtained six or eight large echinococci, and I have the liver of a cat with two large cysts. One of my students, Mr. A. W. Clements, of Lawrence, Mass., examined 270 hogs at the Montreal abattoir and found 10 animals affected.

I do not know of any systematic examination of a large number of animals, but Dr. Dean writes that a considerable proportion of the hogs slaughtered in St. Louis are infested, and Dr. Gross, in his "Pathological Anatomy," 1845, states that one-tenth of the hogs in Cincinnati were at that time affected, and speaks of "whole droves, consisting of three or four hundred animals, all of which were diseased in this way."

The conditions for the development of echinococcus disease in man are certainly present in the country, so far as the existence of the adult worm is concerned, and the immunity which the people enjoy may reasonably be attributed to the existence of sanitary arrangements which reduce to a minimum the risk of infection. Unlike the *tænia* and *trichina*, the echinococcus is not introduced with ordinary food but is probably always obtained by the drinking of water, accidentally contaminated with the feces of dog or wolf. A single ovum is sufficient to produce the most serious damage, as it possesses such capabilities of growth that a huge cyst may develop, containing daughter and granddaughter capsules, each of which has many thousands of scolices or so-called hydatid-heads. One would think that in the cattle and sheep ranches of the Western and South-western States the conditions were very similar to those in Australia where the affection is so prevalent. I am informed, however, that the use of dogs for herding purposes is much less common in this country, but there are probably other factors at work, as some Australian authorities state that the disease prevails in their cities quite as much as in the country.

I have to express my thanks to many persons who have kindly aided me in collecting the facts regarding the distribution of this affection; particularly to the curators of the museums in Washington, Philadelphia, New York, and Boston, to Dr. Billings for access to the MS. of the Sub-

ject Catalogue of Library of Surgeon-General's Office, to Dr. N. S. Davis and Dr. Hatfield of Chicago, Dr. Inglis of Detroit, Drs. Alt and Dean of St. Louis, Dr. Hyndman of Cincinnati, Dr. Atkinson of Baltimore, Drs. Metcalfe and Sullivan of Kingston, Ont., Dr. I. H. Cameron of Toronto, and Dr. Henry Gibbons, Jr., of San Francisco.

ARTICLE XIV.

A CASE OF ELEPHANTIASIS. By THOS. T. S. HARRISON, M.D.,
Selkirk, Ontario, Canada.

THE following case, which, with some hesitation, I have called "elephantiasis," is in some respects so unique, that I think it should be reported and preserved in some journal, the property of the great body of the profession.

John A., now nearly twenty-one years of age, of German parentage, first came under my notice some eighteen years ago. Father immigrated to this country when a mere child; mother, I think, was born here; they lived all their lives in a healthy rural district, farmers by occupation, perfectly healthy, and parents of a large family. The mother showed him to me, saying that one of his legs was too long. She said that at birth he was a large, well-formed, healthy child; that when about two years old he had the right foot slightly hurt, so as to make him limp; that as she knew, or thought she knew, the cause of his lameness, she made no special examination of the limbs until some four or five months after the injury, when she found the opposite leg, the left, to be considerably the longer. I was at this time away from home, and she had consulted a medical friend.

I found the boy was about three years of age, with the left leg an inch and a half or two inches longer than its fellow. The limbs were symmetrical as to the thighs; below the knee the right leg was normal in shape but looked small; the left was much longer, and had a peculiar loose, flabby appearance. There was no sign of a calf. The skin seemed to hang loosely, as if too large for the leg, which, larger than its fellow at the head of the tibia, increased in size to the malleoli, where the superabundant skin and cellular tissue hung over and covered a small and shapely ankle.

I was puzzled by the case, but finally concluded that there was an arrest of growth in the right leg, which had been injured so as to cause lameness ten or twelve months before, but as to the peculiar appearance of the left leg I could give no opinion. The mother told me that the medical men who had seen the case before me, gave her the same opinion that I had.

I saw the child occasionally on my visits to the neighbourhood, or when attending other members of the family; for, excepting the leg trouble, John was always healthy, and I gradually came to the conclusion that the right leg was normal, but that in the left there was not only increased growth of skin and areolar tissue, but that the tibia and fibula were enormously increasing in length.

When the patient was some twelve years old I brought him before the County of Haldimand Medical Association. The leg had steadily increased in length, until it was now over three inches longer than its fellow, and much larger, the size increasing to the ankle. The tissues had a soft, flabby feel; elastic, not pitting on pressure, and increasing in size at the ankle on prolonged standing or walking.

On superficial examination both tibia and fibula seemed to have the angles and ridges exaggerated in size and tuberculated, but steady pressure showed that this roughness was caused by soft tissue, capable of being dented, and that the bone beneath was smooth, evenly enlarged, and the natural ridges and angles scarcely perceptible. At this time we first noticed that the tissues above the knee were affected. The thigh was slightly, but perceptibly elongated, the condyles a little larger than those of the right, and the patella wider, flatter, and longer than normal. In other respects the boy was well formed and healthy. The eyes, however, were rather too prominent, and showed rather too much of a glistening pearly-white sclerotic.

The advisability of surgical interference, as ligating the femoral, section of nerves, amputation, etc., was discussed, but the weight of opinion was in favour of a "masterly inactivity;" and, as in other respects he appeared to be in perfect health, medication seemed to promise nothing, so he was left to nature.

A year ago, last June, I exhibited him before the Ontario Medical Association. He was then nearly twenty years of age. The hypertrophy was still more marked; the soft tissues above the knee and the femur much more implicated, but it did not seem to extend beyond the trochanters. There were many medical men present, some of them of large and varied experience, but no one had seen any case resembling this one. A few gentlemen present objected to its being called elephantiasis, but declined to give it a more appropriate name.

Immediately after this meeting I had the photograph (Fig. 1), giving side view, taken. The books, on which the short leg rests, are nearly six inches high. This does not give the whole difference, as the affected leg is thrown out laterally, while the other is perpendicular. The real excess is between six and seven inches.

I had seen the young man several times since. He always said he was about the same, that he did not think the disease was extending. Last week I examined him for the first time since the meeting, a year ago, and was surprised to see how the disease had advanced. I do not think there is much change in the limb, but the disease has steadily extended upwards, encroaching on the body on that side above the iliac crest, in fact nearly or quite to opposite the umbilicus.

The following is his present condition: He is now a man grown; will be twenty-one in a few days, medium size and height. There is a difference of nearly seven inches between the two limbs; of this, one and three-fourths inch exists between trochanter major and condyle, there is a difference of nearly two inches in circumference at the thigh, three inches and a half at the knee, and ten inches at the ankle (right 8 inches, left 18). The skin and cellular tissue round the left buttock are largely developed, so as to hang down the thigh, and encroach on, and overshadow the opposite buttock, covering the central fissure. Above the gluteal region, extending from the spine, beyond the lateral region, is another soft, flabby enlargement shown in Fig. 2, taken last week.

Fig. 1.

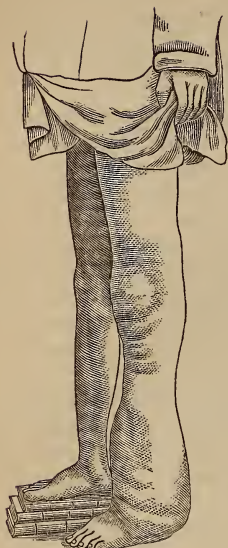
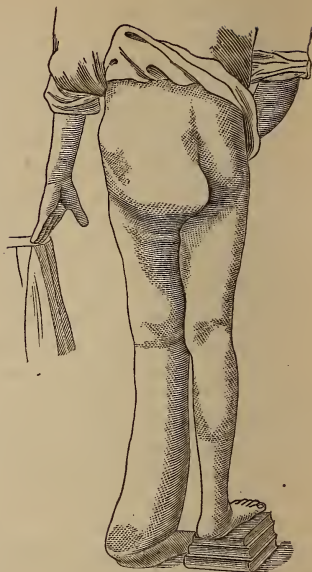


Fig. 2.



The enlargement is most marked in the dependent portions, as the ankle and lower part of buttock, and varies considerably in the erect or recumbent positions. This change is not rapid, but the size of the ankle is increased on prolonged walking, and the prominence of the buttock more marked after riding a reaper for several hours.

The skin has not the harsh, rough feel, or the tuberculated fissured appearance, given as characteristic of elephantiasis. The tissue beneath the skin is soft, moves freely over the underlying muscles or fascia, does not pit on pressure, and has something the feeling of an extravasation in a particularly loose tissue, as the scrotum. The skin is hypertrophied, though smooth and soft; the growth of hairs on the leg greatly above the natural, both in length and calibre, and the skin is mottled with dark brown spots and patches, from mere points to a width of from one to two inches. The thin delicate skin above the ilium is marked with purple blotches, looking like recent bruises, evidently caused by enlarged veins.

The inguinal glands, and those on the thigh are considerably enlarged. The health of the patient is, and always has been, good. He has never needed medical attendance, works steadily on the farm, and the only inconvenience he observes is that he tires after continued walking, especially over rough ground.

The question was raised in Toronto as to whether syphilis might be a factor in the case. But I may safely say that, if so, it must be more than one generation back, as the parents have always lived in a neighbourhood where it is unknown, and a visit to a city for a few hours would be an event in their lives.

The only dyscrasia I have been able to find is that a grandparent died of cancer.

SELKIRK, July 31, 1882.

REVIEWS.

ART. XV.—*Splenectomy.*—*Della Estirpazione della Milza all'uomo, e di un caso operato e guarito dal cav. dottor FERNANDO FRANZOLINI, Chirurgo Primario dell'Ospitale Civile di Udine.*

Extirpation of the Human Spleen, with a Case Operated upon and Cured.

By Dr. FERNANDO FRANZOLINI, Surgeon-in-Chief of the Civil Hospital of Udine, Italy. 8vo. pp. 78. With a table of twenty-seven cases. Turin : Rowe & Favale, 1882.

ALTHOUGH located in one of the smaller towns of Italy, Dr. Franzolini has within a few years obtained a wide reputation as a bold and successful surgeon. He claims a priority of success in several forms of abdominal operation in his own country, viz. : 1. In removing a diseased uterus with the ovaries.¹ 2. In curing a case of confirmed hysterical mania by Battey's operation.² 3. In removing a hypertrophied spleen, and curing a leukæmia by the said extirpation. And he might have added, the first in the world, as far as known, to accomplish this last result.

His monograph under review opens as follows : "On the 20th of September, 1881, I performed, in this hospital, a splenectomy for *leukæmic hypertrophy* on a single woman of twenty-two years of age, who recovered perfectly from the surgical operation, as also the leukæmic condition, and enjoys full and complete health. This is *the first* total extirpation of the spleen for an abnormal condition, followed by cure, that can be incontrovertibly verified in Italy." He bases this claim of national priority upon the firm belief, that the non-fatal operations said to have preceded his were never performed in the form and manner reported ; and he holds this belief upon proofs that the claimants were empirics, whose veracity has long been called in question by able writers.

It has been customary to place at the head of the splenectomy records of the world the name of "Dr. Zaccarelli, of Naples," or his associate in the case Dr. Fioravanti, of Palermo, names which, like that of Nufer, of Cæsarean fame, have often been accepted with some misgiving. As the Palermo story reads : In April, 1549, Dr. Leonardo Fioravanti, of Palermo, was called upon by a certain Greek, Captain Mateo, residing near the garden of the Marquis of Terra Nuova, to visit his wife, Marulla, 24 years of age, and said to have been the most beautiful woman of the city, to consider the propriety of removing her spleen, which was much enlarged by disease, the nature of which is not distinctly stated, other than that it was an oppilation or obstruction (properly, a hypertrophy). The lady having been a favourite in society, and having consulted a number of

¹ Operation, May 28, 1879. Fibro-cystic degeneration of the uterus ; and a right ovarian cyst. This was the third laparo-hysterectomy in Italy, and first case saved.

² Operation, August 14, 1880. "La prima Ooforectomia completa per frenosi isterica, seguita da pieno successo in Italia." Padova, 1880.

physicians, had been urged to submit to an extirpation of her spleen as the only possible means of cure. Under this belief, her husband sought out Dr. Fioravanti, who, conceding that the method was a proper one, secured the services of *Dr. Andriano Zaccarello, of Palo*, a town in the Kingdom of Naples, then present in Palermo. Dr. Zaccarello is described as an old man, who had acquired a reputation as a lithotomist; had extracted cataracts, and was quite an expert in his profession. He had evidently never performed such an operation as was proposed, but was willing to do it, if Dr. Fioravanti would divide with him the responsibility. This being agreed to, Dr. Zaccarello took a razor, and cut open the body of the woman over the spleen, turned out this viscus, separated and removed it, and sewed up the wound, with the exception of a small portion, left for a vent.

Dr. Fioravanti then dressed the wound with compound oil of St. John's wort, and the powders of incense, mastic, myrrh, and sarcocolla, and ordered a potion of water, cooked with common honey, comfrey, St. John's wort, bettony, and carbo santo, and she was directed to take each day a dose of treacle. In 24 days the patient was well, and went to mass to the church of the Madonna dei Miracoli, near the custom-house.

The spleen removed weighed 32 ounces, and was carried to the Merchants' Loggia, where it remained three days, and all the town saw it. Dr. Fioravanti writes of himself: "and the glory of this experiment was given to me, and for this the people flocked to me as unto an oracle." He claimed in another production, that he removed the spleen himself in a traumatic case, in December, 1551, with a favourable result.

Dr. Franzolini denies that either *Adriano Zaccarello* or Fioravanti ever performed the operation. Of another operator, *Ferreri* or Ferrerius, he says the same, explaining that the case of Ferreri was one of abscess of the spleen, with a fistulous opening near the umbilicus, and another in the vagina; that the operation consisted in evacuating the abscess by abdominal incision; and that the tissue of the spleen having been entirely broken down, its thickened capsule was finally discharged through the wound. This case occurred in 1711, and the subject was a plethoric woman of thirty years of age, who bore a child subsequently; and died in 1716. As no vestige of her spleen was found on autopsy, the story became current that it had been extirpated. In the records of abscesses of the spleen, such cyst-like collections of pus, with fistulæ, have been found on autopsy. A third Italian case, but not mentioned by Dr. Franzolini, is that credited to Fantoni, of Turin. Its description would indicate that it could never have occurred as recorded. There are many reliable traumatic cases on record, in which partial or complete extrusion of the spleen occurred; but we are not prepared to give credence to a report in which it is related that a mother by castigating her daughter (a little girl), on or about the year 1700, opened her abdomen with a stick, and let out her spleen. Such a stroke would be much more likely to rupture this viscus than to open the abdominal cavity.

It is no simple task to set aside the claim of Zaccarello after it has been more or less credited, since the case was published by his associate Fioravanti, in Venice, in 1570, twenty-one years after the operation. We will therefore produce the arguments and evidences furnished in the paper under review, which in the opinion of its author are conclusive against it. He speaks of the operator as, "*a certain Adriano Zaccarello*, a Neapolitan empiric, who, in Palermo, in 1549, extirpated an

obstructed spleen in a Grecian lady, obtaining a cure, the case having been reported for the first time by a certain Leonardo Fioravanti, in a book entitled *Tesoro della vita umana*, published in Venice in 1570, page 25, book ii., chap. viii."

1. "In the French Surgical Dictionary of Louis¹ (1818), at page 176 of the third volume, under the head of *the spleen*, we read, "Leonardo Fioravanti claims to have extirpated the spleen for a woman of Palermo with entire success, and that the spleen weighed more than thirty-two ounces.² Several authors who have regarded Fioravanti as a charlatan of the first class, hold the operation under some suspicion." Here it will be noticed that the case is credited to the reporter, a not uncommon error in statistical records at the present day.

2. Ribes, the author of the article, "*la Rate*," in the large *Dictionnaire des Sciences Médicales*, Paris, 1820, vol. xlvii., page 24, writes, that "by many, Fioravanti is regarded as unworthy of belief, and they doubt his having performed this operation."

3. "Hyrzl," in his celebrated *Anatomia Topografica*, page 744, vol. i., "doubts the evidence of Zaccarello having extirpated the spleen."

4. Prof. Alfonso Corradi, in his *Commentario della Chirurgia in Italia*, page 425, says, "but Mr. Leonardo Fioravanti was not such a man as to secure one's confidence."

5. "Prof. Gustav Simon, in his monograph upon extirpation of the human spleen (Giessen, 1857), at page 6, makes the following critical observations upon the case of *Zaccarelli*: The authenticity of this case is held in doubt by almost all writers (see Dieffenbach, Hyrtl, etc.), and, second, Heinrich (Diseases of the Spleen, page 228). Mappus,³ in his meritorious dissertation, *De Lienosis*, Strasburg, 1692, demonstrates satisfactorily, that the attestation of Fioravanti does not appear to be worthy of the least credit." This judgment of Mappus is approved by Heinrich after reading the evidence. "We read in the report (Fioravanti's) of the tumour of the spleen; that it was so large that the body would not be able to contain a greater; and still we are told that it weighed but thirty-two ounces." The *uncia* was a fraction less than a pound avoirdupois.

It would appear then probable that both the operator and reporter were charlatans. Fioravanti would certainly in this day be regarded as a traveling quack doctor, and one who used secret compounds and cure-alls with high-sounding titles; but in the day when he flourished the practice of medicine and surgery was largely empirical and mysterious. It has been objected to, that writers have assigned different reasons for the operation on the Greek lady; but these all point towards the same condition. "To cure her of a melancholy," meant that the enlarged spleen was due to a quartan fever, which Fioravanti taught had its origin in a disturbance of the melancholic humours.⁴ At the time of the said operation, he believed a quartan ague to be incurable, but later in life he publishes the formula of a secret and wonderful medicine, which he states was a sure cure. The claim that these men were charlatans is rather in their favour, except for

¹ Encyclopedie, ou dictionnaire raisonné des sciences, des arts et des metiers par une Société de gens de lettres, Berne et Lausanne, 1808.

² Collier, in his table, gives the weight as 2 lb. 15 oz., and says that six years afterwards there was no trace of the spleen; that the liver was enlarged, and the omentum shrunken. (Lancet, Feb. 11, 1882, p. 220.)

³ Marcus Mappus wrote several works, one as early as 1660.

⁴ In the original article of Fioravanti nothing is said of the cause of the splenic enlargement. Its quartan origin must be stated elsewhere, if stated at all.

the additional evidence that Fioravanti, who reported the case, had a bad reputation for truth and veracity. Charlatans, and the ignorant of both sexes, have often been the pioneers in bold surgical operations. Nufer, who stands at the head of the Cæsarean operators, was a gelder. The first to operate in the British Isles was a woman; as was also the case (self-inflicted, 1769) in the West Indies. Two women have operated in the United States (one self-inflicted); one in Austria, etc.; and the first man to suture the uterus in our country was a travelling Virginia charlatan, who was thirty-three years in advance (1828) of the first *regular* operation (1851). That these two Italians named did perform some abdominal operation is possible, but the want of a minute account of the steps of the case makes it very doubtful as to what was done. The late Gustav Simon conjectured that the tumour might have been a left ovarian cystoma with a small adherent spleen; but this is only a surmise, and not at all in accordance with the theory of its *quartan* origin. We are inclined to adopt the belief that there was no splenectomy in the case; and, at all events, to take the benefit of the doubt by rejecting it from the record as the statement of a very unreliable writer. If we had not already in this Journal disposed of historical claims about which there is now no question, and which came indirectly through much more reliable writers than Fioravanti, we should hesitate long before setting aside this claim. We are to recollect that this purports to be the first operation of its kind in the world; and the first success in an operation which has usually resulted in death by shock or hemorrhage in the most skillful hands, and with all the advantages of modern surgery.

Having disposed of three Italian cases, we come to an American one in Franzolini's table which was unquestionably not a splenectomy. Dr. G. Volney Dorsey, of Piqua, Ohio, under the names of "*Dorsay*," and "*D'Orsay*," has been credited in foreign and home statistics (one writer copying the error from another), with having removed a diseased spleen, with a successful result. Dr. Dorsey did in 1855 (Sept. 2d) make an exploratory incision into the abdomen of a farmer of 40 years of age, who had long suffered with violent pain, particularly in the region of the spleen. Finding this organ enlarged and adherent, he broke down the adhesions and restored the viscus to what he conceived to be its normal position, and the man recovered his health. This was certainly a bold and novel treatment, so much so that the late Dr. Eve gave the operation a notice in his work upon the "Remarkable Cases in Surgery," nevertheless there was nothing taken away. One might readily argue from this error against giving credit to the Zaccarello report, for if such mistakes can become current now, why might they not have become so three centuries ago, although having some foundation? In one sense Dr. Dorsey did *remove* the spleen, but he never claimed that he extirpated it.

Splenectomy has certainly been performed six times in Italy, and all of the operations proved fatal but the sixth. We are not aware of the report of any case having been published since that of Franzolini. The six cases are in few words as follows:—

1. The first operation about which there can be no question, was performed on January 20, 1874, at the Civil Hospital, of Cesena, by its Surgeon-in-Chief Professor Attilio Urbinati. The subject was a woman affected with simple hypertrophy of the spleen which was removed through an incision in the *linea alba*, the pedicle being ligated *en masse* with wire and dropped in. The patient died in four days. The autopsy revealed no evidences of peritonitis or hemorrhage, and the intestines were not obstructed. The cause of death was attributed to

torsion of the stomach produced by an enormous evolution of gas. The splenic artery was found atheromatous.

2. By the same operator in 1878. Subject also a woman with a hypertrophied spleen: thought probably leukæmic. The operation presented no special difficulty, and antiseptics were employed. The patient died of collapse in forty-eight hours.

3. Dr. Andrea Aonzo, Surgeon-in-Chief of the Hospital of Savona, operated on the third case on the 16th of June, 1878. The subject was a woman of 24, married, and had borne children, who was affected with hypertrophy of the spleen. The organ was quite movable, as the gastro-splenic ligament was $6\frac{5}{8}$ inches (16 cm.) long. There were some adhesions which were easily separated. The pedicle was ligated in mass with double wire, the operation was completed in forty minutes, and the patient bore the anæsthesia well. She died of collapse in three hours. No autopsy was made.

4. Dr. Giuseppe Chiarleoni, of Milan, now Professor and Director of the Obstetrical School, and Surgeon-in-Chief of the Ospedale maggiore of Vercelli, operated on March 26, 1881. The subject was again a woman, aged 32, and affected with simple hypertrophy of the viscus. The tumour was free, except at the vault of the diaphragm, and the inferior face of the left lobe of the liver. The pedicle was tied in three portions for greater security. The patient died in three hours. There was no autopsy, but death was attributed to hemorrhage which was thought to have come from the torn adhesions to the diaphragm.

5. Prof. Celso Bonora, of Urbino, operated at the Civil Hospital, on May 21, 1881, on a woman of 53, affected with simple hypertrophy of the spleen without any adhesions. The pedicle was tied with carbolized silk ligatures, and additionally secured in mass by a wire in the *serre-noeud* of Cintrat. The operation was completed in half an hour, and the woman died in three and a half hours of collapse, aided by a moderate hemorrhage from a branch of the inferior diaphragmatic artery, which had either not been ligated or was not well secured. The woman was anæmic, and leukæmia had been suspected but had not been tested under the microscope.

6. Dr. Fernando Franzolini, operator. This case forms the basis of the monograph under review, and is of very great interest, as it would appear to decide in the affirmative, the question of the possibility of extirpating without fatal result, a leukæmic spleen, and of restoring by the operation, the normal character of the blood. This has been denied quite recently in England without any reference to this case, and the operation denounced as unjustifiable and useless.¹ The following is a condensed record of the case.

Giulia Lazzarini, single, aged 22, an operative in a match factory of Ponderno, a suburb of Udine, in Northern Italy. Her father died pellagrous; mother living; a young sister showed signs of scrofulous disease of the bones, and one grown up was a pale blonde, fat and flabby. Giulia had always been delicate; as an infant she presented a tumid abdomen; at ten she had a gastralgia, which only yielded after a long treatment. From twelve to fourteen she was ascitic and her lower extremities were quite œdematous. She did not menstruate until the age of seventeen. In the beginning of 1879 she commenced to suffer from a dull pain in the left upper fourth of her abdomen, which became increased on standing, and much aggravated under pressure. After a year and a half of suffering, she entered the medical department of the Civil Hospital of Udine, which was in July, 1880. Under treatment an abdominal tumour presumed to be the spleen was readily detected. She left the Hospital in November, and returned in January, 1881, when she was placed under the care of Dr. Franzolini, as a surgical case, who found by examining her blood under the microscope, that it contained an abundance of leucocytes, and he decided the case to be one of "*spleno-hypertrophic leukæmia*." She went home on June 11th, and returned on September 1st, fully determined to run the risk of an extirpation of the spleen. After an appropriate medical and dietetic preparative treatment, the operation was performed on September 20, 1881, under chloroform.

¹ See discussion in Clinical Soc. London, March 24, 1882, Med. Times and Gaz. April 15, 1882, page 395.

She was at this time extremely pale, but weighed 136 pounds. No swollen glands could be detected, or pain elicited by pressure over the seats of ganglia. Her abdomen was globose, fat, and pressure excited a diffused pain; her urine was not albuminous. From a very careful examination of her blood made under the microscope, on September 9th and compared with specimens obtained from healthy subjects, a mean of ten slides on either part being taken, it was ascertained that her blood contained an excess of white corpuscles amounting to 400 per cent. or 30 corpuscles where healthy blood contained 6.

The incision was made in the *linea alba* $8\frac{3}{4}$ inches in length, through an adipose deposit 2 inches in thickness. After the abdomen was opened, it was found very difficult to turn out the spleen, and when out, the shortness of the gastrosplenic omentum (one inch), which was also thickened with fat, made it impossible to ligate the vessels without returning it. The splenic artery was enlarged to the size of the index finger, and the splenic vein would admit the thumb. These vessels were ligated separately by means of an appropriate *portefil*, two carbolized silk cords being placed around each after being dissected free from fat. The omentum was then ligated in sections by being transfixed with a Peruzzi needle, and there being no inflammatory adhesions, the ligated parts were separated with a button-tipped knife within a quarter of an inch of the spleen. There was not a tablespoonful of blood lost. Finding there was no hemorrhage from the splenic vessels or vault of the diaphragm, the ligated parts were dropped in and the wound sutured. Time of operation an hour and twenty minutes. Size of spleen $10\frac{1}{4}$ inches long, $6\frac{1}{2}$ wide, and $2\frac{3}{4}$ thick.

The woman had no collapse; urinated voluntarily four hours after the operation; slept five and a half hours continuously the first night. Forty hours after operation there commenced a stillicidium of blood from the vulva, with lumbar and sacral pains, which lasted four days. On the eighth day a pain deep seated, and in the region of the spleen, accompanied with fever, introduced an attack of pleurisy with effusion on the left side. This went through the usual course of favourable cases, and the fluid had disappeared by the twenty-eighth day. By this time the wound had entirely healed, and there were no symptoms referable to the seat of the operation.

Giulia, at intervals of twenty to thirty days during her convalescence, was attacked with pain in the abdomen, especially in the hypochondria, and the regions of the ovaries and sacrum, with headache and restlessness, but without fever. The first of these was on October 9th, which was followed in four days by an abundant menstruation. This diminished, but did not cause a cessation of the suffering. Acting on the belief that these attacks originated in congestion, Dr. Franzolini treated them with relief by leeches around the anus.

On October 26th, thirty-six days after the operation, the microscope showed that the red globules had recovered their normal size and colour, and that the white corpuscles as compared to the normal proportion in healthy blood, had fallen from 30 to 6, to 15.7 to 6. A second examination made on November 15th gave 11.40 to 6; a third on December 6th, 10.7 to 6; and a fourth on January 25, 1882, 7.04 to 6. At the last report the woman was regarded as perfectly well; lips of good colour; able to work all day; eating and sleeping well; vivacious, and conscious of no derangement in her bodily health.

The results of the Italian splenectomies in a recovery of $16\frac{2}{3}$ per cent., which are nearly upon a par with those of the rest of the world, show the dangerous character of the operation, even in very skilful hands. Dr. Urbinati who died in April, 1881, at the age of 42, was regarded in Italy as a surgeon of remarkable skill, and he had in his first operation the aid and counsel of Dr. Peruzzi, of Lugo, certainly one of the ablest ovariologists in Italy; still, he lost both cases. Dr. Aonzo's case had a long pedicle, and the spleen was easily removed; the patient had the advantage of youth, but, nevertheless, death rapidly followed the removal of a spleen which measured 14 inches long, $7\frac{7}{8}$ inches wide, and $3\frac{1}{8}$ inches thick. Dr. Chiarleoni, who called to his aid the well-known Professors Porro and Chiara, who have made themselves famous by their successes

in abdominal surgery, lost his patient likewise, although every precaution possible appears to have been taken to avoid hemorrhage. And the fifth operation, under Professor Bonora, resulted as all of its predecessors; but here the age of the woman (53), and the probable leukæmic condition of her blood, which was not examined, diminished very materially the hope of success.

Dr. Franzolini's success shows that such a result is attainable even in an unfavourable case, for certainly his was one, in its history from childhood up. There can be no question that he did accomplish in a leucocythæmic case, what has heretofore been believed an impossibility; and some of the opponents of the operation will be forced to modify their views somewhat as to the possibilities of splenectomy under certain unusual leukæmic conditions of system being a curative operation.

The first danger in this operation, as shown by the cause of death in perhaps fully one-half of the cases subjected to it, is hemorrhage, occurring in, or immediately after, the division of the connections of the spleen, and especially those most remote from the abdominal opening. Any adhesion to the diaphragm or liver is a special element of danger. The anæmic condition of most of the subjects to be operated upon, renders a moderate hemorrhage almost certainly fatal.

Next to hemorrhage comes that often unaccountable condition, *shock*; a term which is frequently used to cover an ignorance of the real cause, in cases where an autopsy cannot be obtained. In the removal of a highly vascular organ enormously enlarged, containing several pints of blood, we deplete the circulation very largely, and thereby produce a condition which, although not the same as an immediate hemorrhage, is allied to it in the impression which it produces upon the system. Hence, a condition of danger often fatal in results, which the method of Esmarch has been devised to overcome. The removal of the spleen when of normal size, as shown by the results of a large number of traumatic cases, is not a very dangerous operation. Where a part or the whole of the viscus has been extruded through an incised wound, and removed after ligation, the patient has generally recovered. In the few cases of *wandering*, or prolapsed spleen that have been operated upon by excision, the fatality has been far less than in those of the removal of the hypertrophied organ.

The complex character of the pedicle, the dilated condition of the artery and vein, the omental connections, the proximity of the stomach and pancreas, the adipose deposits in the gastro-splenic omentum, and the lymphatic vascularity of an enlarged spleen, are all to be considered in estimating the difficulties and dangers of splenectomy, which is certainly one of the most dangerous of all the extirpative operations upon the human abdomen.

The question which will naturally arise in reference to the case of Dr. Franzolini is, was it one of unquestionable leucocythæmia? Mr. Herbert Collier has placed it in his table of extirpations, in which the disease of the spleen was "unassociated with leucocythæmia," and designates the enlargement as "simple hypertrophy." But he had evidently not seen a full record of the case, with the diagnosis of the operator. When first announced in the Italian journals, shortly after the operation, the case was given with this title; but this was altered when the true nature of the enlargement was reported. The fate of all the other splenectomies in leucocythæmia, will direct special attention to this exceptional one, and the second inquiry will be, if the woman had really a leukæmic spleen,

how is her entire recovery to be accounted for? It is a very simple matter to doubt the diagnosis on account of the exceptional termination of the case; but if leucocythæmia did not exist, how are we to account for the association of a splenic hypertrophy with a decided permanent increase in the proportion of the white corpuscles of the blood? The patient had never had intermittent fever; her spleen had been gradually enlarging for two and a half years. An excess of leucocytes had been detected in her blood nine months, and again at eleven days before the operation, and she suffered from dyspnœa and attacks of vomiting. It is true that the proportion of leucocytes as given, is very much below that which is common in splenic leukæmia. In healthy blood there is one white corpuscle to from 350 to 500, and in many adults to 1000 red ones. In leucocythæmia it is rare to find the proportion less than one white to twenty red globules, and the former is frequently one to ten, and may be as great as one to three or two red; and in one case reported, was even three white to two red. Unfortunately Dr. Franzolini had no *hæmectometer*, and does not state the reduction of the number of red globules in a given quantity of blood below normal, or the numerical proportion of leucocytes to red corpuscles. It is evident that the case was unusually favourable, as one of leukæmic degeneration, for a splenectomy, hence the remarkable escape from death, and the ultimate recovery. This being a very exceptional case, cannot be taken as a proof in favour of a general propriety of operating upon leukæmic subjects, it can only be used in a limited degree and applied to such cases as are found by the microscope to possess a fair proportion of red to white blood-globules, as the hemorrhagic tendency and danger of collapse would appear to be in proportion to the degree of leukæmic degeneration. We find very little encouragement in the case of Dr. Franzolini to induce one to operate upon the average of leucocythæmic patients. According to the nomenclature of Virchow, his patient had not a *leucocytosis* or *pseudo-leucocythæmia*, but a true leukæmia, or permanent *leucocythæmia* of unusual character. The fact that she escaped death under the additional complication of a pleurisy with effusion, goes to show that her blood was still in a condition to favour a recuperative process. The size of the spleen had also much to do with the escape from shock and exhaustion.

From the following table have been excluded the "Zaccarello" and "Ferreri" cases, which are of very doubtful authenticity; and the Dorsey case, which was not an extirpation. There are, no doubt, other cases that might be added to the record, but the table as it is will suffice to show the surgical status of the operation. The traumatic cases are perhaps nearly double of the above; the saving in them by partial or entire removal of the spleen has been from 50 to 60 per cent. *Splenotomy* in this class of cases has been much more frequently performed than total extirpation.

General Summary.—It will be seen by the table that there were only six men operated upon to twenty-three women. Of the 32 cases, the spleen was decidedly enlarged in 30; and of these there were 7 affected with simple hypertrophy; 16 with decided leucocythæmia; 2 with hypertrophy believed to be leucocythæmic; and 1 of splenic leucocythæmia with a small proportion of leucocytes. The leucocythæmic spleens varied in weight from about $2\frac{1}{2}$ pounds to $18\frac{1}{2}$. Of the 19 cases believed to be more or less leukæmic, 18 died. Of these 18, 12 died directly of hemorrhage, varying in time from 15 minutes to 18 hours; 3 of shock; and 1 each, of collapse, exhaustion, and peritonitis.

Table of Splenectomies, for Disease or Displacement of the Viscus. By R. P. HARRIS, M.D., Philadelphia.

No.	Date.	Operator.	Locality.	Sex	Age	Nature of disease.	Weight of spleen.	Cause of death.	Recoveried.
1	Oct. 5, 1836	Quittenbaum	Rostock	F.	22	Hypertrophy of spleen in a cirrhotic subject	5 lb. 8 oz.	Hemorrhage, in 6 hours.	
2	Mar. 19, 1855	Küchler	Darmstadt	M.	36	Hypertrophy of spleen in a cirrhotic subject.	3 " 5 "	Hemorrhage, in 2 hours.	
3	Nov. 20, 1865	S. Wells	London	F.	34	Simple hypertrophy	6 " 15 "	Thrombosis, in 6½ days.	
4	June 20, 1868	T. Bryant	London	M.	20	Leucoeythæmia	4 "	Hemorrhage, in 1½ hours.	
5	Sept. 6, 1867	Péan	Paris	F.	20	Hypertrophy with nullo-cular cyst of spleen	2 " 8 "	.....	R.
6	Sept. 21, 1867	Koerberle	Strasbourg	F.	42	Leucoeythæmia	14 " 3 "	Uncontrollable hemorrhage soon after operation.	
7	Nov. 9, 1867	T. Bryant	London	F.	40	Leucoeythæmia	10½ "	Hemorrhage from adhesions, in 15 minutes	
8	S. Wells	London	.....	..	.....	Hydatids followed by sanguinous discharge	.....	Peritonitis, on third day.	
9	1873	Koerberle	Strasbourg	F.	27	.....	.....	Shock, in 17 hours.	
10	Nov. 1, 1873	Watson	Edinburgh	M.	..	Leucoeythæmia	8 "	Hemorrhage or shock, during operation.	
11	Jan. 20, 1874	Urbinate	Cesena, I.	F.	..	Simple hypertrophy	.....	Torsion of the stomach from evolution of gas, in 4 days.	
12	1875	Czerny	Heidelberg	F.	30	Floating spleen	.....	.....	R.
13	April 23, 1876	Péan	Paris	F.	24	Simple hypertrophy	2 " 7 "	.....	R.
14	1876	S. Wells	London	..	..	Leucoeythæmia	2 " 7 "	Hemorrhage, in a few hours.	
15	Jan. 28, 1877	Billroth	Vienna	F.	45	Leucoeythæmia	6 " 9 "	Hemorrhage, in 4 hours.	
16	Feb. 23, 1877	H. L. Browne	W. Bromwich	M.	20	Leucoeythæmia	18 " 8 "	Shock in 5 hours; no hemorrhage.	
17	1877	Fuchs	Berlin	F.	40	Leucoeythæmia	12 " 13 "	Hemorrhage, in 18 hours.	
18	May 13, 1877	A. Martin	Heidelberg	F.	31	Floating spleen with neuralgic patus	.....	.....	R.
19	June, 1877	Billroth	Vienna	F.	31	Leucoeythæmia	11 " 11 "	Uncontrollable hemorrhage within 1 hour.	
20	June 6, 1877	G. B. Simmons	Sacramento	M.	40	Leucoeythæmia	7 " 8 "	Hemorrhage, in 2½ hours.	
21	Jan. 1, 1878	Geisvrell	Essen	F.	39	Leucoeythæmia	9 " 15 "	Hemorrhage, in 16 hours.	
22	July 1, 1878	Czerny	Heidelberg	F.	24	Leucoeythæmia	.....	Hemorrhage, in a few hours.	
23	Sept. 25, 1878	Arnsion	Newcastle upon Tyne	M.	37	Leucoeythæmia	7 " 13 "	Hemorrhage, in 5 hours.	
24	1878	Baker Brown	London	..	..	Leucoeythæmia	.....	Shock, during operation.	
25	1878	Urbinate	Cesena, I.	F.	..	Hypertrophy, thought leucæmic; no examination	.....	Collapse, in 48 hours.	
26	Mar. 24, 1879	J. F. Miner	Buffalo	F.	40	Hypertrophy, probably leucæmic; no adhesions	7 " 4 "	Exhaustion, in 18 hours.	
27	Mar. 26, 1879	Chiaroni	Milan	F.	32	Simple hypertrophy	6½ "	Hemorrhage, in 3 hours.	
28	May 21, 1879	Bonora	Urbino, I.	F.	53	Simple hypertrophy	7 " 8 "	Collapse with moderate hemorrhage, in [3¼ hours.	
29	June 16, 1879	A. Aonzo	Savona, I.	F.	24	Hypertrophy, long pedicle	10 "	.....	R.
30	Aug. 2, 1879	Czerny	Heidelberg	F.	24	Simple hypertrophy	7½ "	.....	R.
31	Sept. 20, 1881	Franzolini	Udine, I.	F.	22	Splenic leucoeythæmia, with a small proportion of leucocytes.	3¼ "	.....
32	1882	W. Haward	London	F.	49	Leucoeythæmia	7 " 8 "	Shock, in 5 or 6 hours. Vomiting severe; no hemorrhage.	6

Of the whole 26 fatal cases, 15 bled to death, and not one lived as long as a week. 23 of the 26 cases died directly from the effects of the operation; the three indirectly fatal results were, 1 from thrombosis in $6\frac{1}{2}$ days; 1 from torsion of the stomach in 4 days; and 1 from peritonitis on the third day. Of the seven cases of "simple hypertrophy," but two recovered. Floating spleens are said to have been removed in two additional cases, both of which died. These would bring up the list to thirty-four.

Since the preceding was in type, we have received accounts of three additional cases, two of them in the United States, making in all 37 operations for the removal of diseased spleens, with 7 recoveries; or a fraction less than 19 per cent.

35. The first splenectomy in the United States, has been claimed for Dr. Oscar C. Dewolf, formerly of Northampton, Massachusetts, and more recently of Chicago, Ill., by a physician who was present at the operation, which was performed on a woman at Florence, in the former State, in or about the year 1870. The spleen was extirpated for disease, and the patient was apparently doing well for a day or two, but then died suddenly. (*Boston Med. and Surg. Jour.*, August 8, 1878, page 195.)

36. Dr. L. C. Lane, of San Francisco, California, removed a diseased spleen (sex of patient not given) at the St. Mary's Hospital in that city, in 1877. There being extensive adhesions, some of them to the diaphragm, there was a severe hemorrhage set up, which so endangered the life of the patient, that transfusion of blood was resorted to. This enabled the operator to complete the operation and close the wound; but there being still some bleeding, the transfusion was resumed; the tube became obstructed, and before it could be cleared the patient died. (*Pacific Med. Jour.*, Nov. 1877, page 271.)

37. Dr. Crédé, Jr., of Dresden, removed the spleen of a mason, of 44 years of age, for cystic disease, on September 25, 1881. The man was quite anæmic, notwithstanding which, he recovered, and in time his anæmia disappeared. He had suffered for years with painful sensations in the splenic region, which finally culminated in the formation of a large cyst. (*Berliner Klin. Wochenschrift*, June, 1882, page 407.)

This case corresponds in character and result with that of Dr. Péan, No. 5 in the table, which was diagnosed as an ovarian cyst. The cures have been in cystic disease of spleen, 2; in prolapsed spleen, 2; in simple hypertrophy, 2; and in hypertrophy associated with mild leukæmia, 1.

The experience of all who have operated upon cases of *decided* leucocythæmia, and the general testimony of surgeons who have carefully examined their records, are against the propriety of operating, where the microscope reveals this blood disease. In cases decidedly anæmic, the risk is very great, but recovery is not impossible, as shown by the case of Crédé. The case of Franzolini is so rare a one, that it is not likely to be duplicated in a long period of years.

The removal of an enlarged spleen, whether affected with simple or leukæmic hypertrophy, is shown to be very fatal. Skill is all important, but it is seldom successful. Whether the operation be readily performed or not; or the bloodvessels ligated separately or in mass; or the pedicle secured in the abdominal wound or dropped in, the patient usually dies. If there is no blood lost by hemorrhage, the case is still apt to be fatal, and this we attribute to the removal of so large an amount of blood in the tumour. If this blood be filled with leucocytes, then the loss of its red

corpuscles from the circulation is a fatal one. It might be a question to be considered, whether the transfusion of healthy blood, as soon as the vessels of the spleen are ligated, might not counteract the effect of this sudden removal of that contained in the splenic arteries and veins. This whole subject is one of very great surgical interest.

R. P. H.

ART. XVI.—*Transactions of the American Gynecological Society.*
Vol. VI. for the year 1881. Philadelphia: Henry C. Lea's Son & Co.,
1882.

THIS volume is the record of the annual meeting held in the Academy of Medicine, New York, on September 21, 22, and 23, 1881, when 33 of the 54 Fellows were present. The President, Dr. William H. Byford, being absent, his address was read by the Secretary. Dr. Thomas Addis Emmet, of New York, was elected President for the year 1881-82. The Society will hold its next meeting, in Boston, on September 20, 1882.

The address of Dr. Byford, which was chiefly historical and congratulatory, recommends the formation by the ovariologists of America of a McDowell Fund, the income from which shall be used as a prize "for lectures or essays upon such subjects connected with gynecology" as may be designated, the said fund to be in the hands of the Society, and the prize to be awarded annually.

Acute Hyperæsthesia of the Peritoneum, either circumscribed or diffused, following minor Gynecological Operations and Manipulations, by SAMUEL C. BUSEY, M.D., Washington, D. C. To explain his title the author instances the case of a lady affected with dysmenorrhœa and ante flexion of the uterus, in whom he made use of a small sea-tangle tent; but such was the agony produced by its expansion that her husband was obliged to withdraw it in forty minutes. The pain began almost immediately in the cervix and extended entirely over the abdomen, which became sensitive to the touch or weight of the bedclothes, and every jar of the floor was felt by her. "Coldness of the extremities, pallor of the face, nausea and vomiting, and vesical irritability took place apparently simultaneously with the hyperæsthetic phenomena." Chlorodyne and hot fomentations relieved her, so that by the next day there was left only a slight feeling of soreness in the hypogastrium. The next menstrual period was unusually free from suffering. There was no fever or tympanites in the painful attack.

Dr. Busey accounts for the attack as follows: "The tent was the exciting cause, and the focus of irritation was located along the cervico-uterine canal. . . . The pallor and coldness were due to irritation of the vaso-motor centre, the gastric and cardiac disturbance to irritation of the pneumogastric centre, and the diffused pain and tenderness to irritation of the sensory fibres of the sympathetic supplying the peritoneum. It is not improbable, however, that this exaltation of sensibility may have had its cause in the probably existing passive hyperæmia of the peritoneal capillaries, the natural result of the emptiness of the superficial integumentary capillaries."

Dr. Campbell believed this to be "the first link in the chain of inflammation." He preferred the title of "peritoneal tenderness."

Dr. Van de Warker objected also to the term hyperæsthesia of the peritoneum; he had always regarded peritoneal tenderness produced by gynecological treatment as the beginning of inflammation. He had no doubt that there is one class of cases in which the pain is purely a neurosis; as, for instance, immediately after the introduction of a sponge-tent, or of an application to the endometrium when the pulse becomes thready, and a cold, clammy perspiration breaks out, as symptoms of collapse, a condition which is immediately relieved by an anodyne, and that is the last of it."

Dr. Engelmann objected to naming an affection by the symptoms present; he thought we should go to the bottom and find out the cause; the title offered was only descriptive of symptoms, but did not suggest the pathological condition.

Dr. Emmet thought the term proposed misleading, and that the condition was one of shock, tending in its reaction to inflammation. His experience had taught him that in cases where pelvic inflammation had existed previously we were most likely to have this shock, and afterward peritonitis. He regarded the condition in Dr. Busey's case as hysterical rather than inflammatory.

Dr. Noeggerath thought Dr. Busey's case belonged to the class of neuralgias; as did also Dr. Sims.

Exploratory Puncture of the Abdomen, by HENRY J. GARRIGUES, M.D., New York. This is a microscopical, chemical, and histological examination of the various fluids obtained as products of disease, by the aspiration of the abdominal cavity and of cystic growths contained within it, as a means of diagnosis; with a table of 57 operative and 37 tapped cases. The varieties of disease treated of are, *myxoid proliferous cystoma*, the common variety of ovarian cysts; *dermoid ovarian cysts*; *hydrops folliculi*, or *true monocyst*; *multilocular ovarian cysts, with watery fluid and ciliated epithelium*; *malignant ovarian cysts*; *cysts of the broad ligament*; *uterine fibro-cysts*; *amniotic fluid*; *dropsy of the Fallopian tube*; *cysts of the abdominal wall*; *cysts of the urachus*; *spina bifida*; *hydatids*; *cysts of the mesentery*; *cysts of the spleen*; *cysts of the liver*; *hydronephrosis*; *renal cysts*; *ascites*, and *encysted peritoneal collections*.

Dr. Garrigues says of the Drysdale corpuscles, or "granular ovarian cells," that "they are entirely like the *pyoid bodies* described and delineated by Lebert, who, as early as 1846, indicated the test with acetic acid as characteristic of them;" and that Lebert says, that he found these bodies in the peritoneum, synovial membrane of the knee, in congestive and metastatic abscesses, and often mixed with common pus corpuscles, both in extravasations and in the false membranes seen on mucous and serous membranes. He claims that they were first described as ovarian, in 1852, by John Hughes Bennett, and says they are nuclei and not cells, and are in a state of fatty degeneration, with highly refracting globules in their interior. "These bodies are not only not pathognomonic of ovarian cysts, but they do not even prove that the fluid examined has been taken from any kind of cyst." He claims to have found them in a cyst of the broad ligament; in a suppurating cyst of the abdominal wall; cancer of the peritoneum; a renal cyst, and in one of the vagina; and that he failed to discover them in six ovarian cysts. He says that there is no pathognomonic morphological element in the fluid of ovarian cysts, and that the nearest to this is the columnar epithelial cell seen in side view, which is found likewise in the cyst of the broad ligament, and in the Fallopian tube.

Dr. Garrigues advocates exploratory tapping, believing that there is less risk from it than from opening the abdomen in cases unfit for operation. He taps the patient always at her home; immerses the trocar and canula for five minutes in a five per cent. solution of carbolic acid; washes first the abdomen with soap and water, and then with the dilute carbolic acid; and to avoid hemorrhage introduces the canula slowly, using one which is only two millimetres in diameter. He recommends that all the fluid contained in the cavity should be withdrawn, making an exception in fibro-cysts of the uterus. After operating he keeps the patient in bed for four days to avoid the risk of peritonitis.

Dr. Drysdale, in reply, promised to prepare a paper upon the ovarian corpuscle for the next meeting. He referred to the important diagnostic fact that coagulation of the fluid from fibro-cystic tumours of the uterus occurs immediately on its removal, while that of the ovarian cyst takes place slowly, sometimes not for days.

Dr. Leopold Meyer, of Copenhagen, said that his opinion, formed from conversing with gentlemen of different countries, was that tapping should not be so general as recommended; that it was in a minority of cases that we could not make a positive diagnosis without it. He thought that Dr. Garrigues had presented the measure in too favourable a light; he had seen the uterus lie in front of the tumour, and large bloodvessels in the way of the trocar. He thought the cases for tapping were few and exceptional; and that an exploratory incision under antiseptics was not much more dangerous than tapping.

Dr. H. P. C. Wilson agreed with Dr. Meyer; he had lost a case by aspiration, and should not use it again except in one of doubtful diagnosis.

Dr. Barker related a case which proved fatal in the hands of the late Dr. Peaslee, who in tapping her had opened a vein in the mesentery.

Dr. Emmet was decidedly opposed to tapping, as in his experience it was exceptional not to have trouble in some form after it. In a large number of cases inflammation of the sac followed, complicating the subsequent operation. Death had followed the drawing off of a small quantity of fluid with a hypodermic needle; he had one case die from the removal of half a drachm.

Dr. Reeve thought that tapping should be done in certain exceptional cases, such as in those presenting the evidences of a thin-walled single cyst, to determine by the character of contents, whether the cyst is ovarian, or of the broad ligament.

Dr. Engelmann remarked, that scientifically, the paper was one of extreme interest, but practically, he did not think we should often gain much by tapping, simply for the purpose of examining the fluid microscopically.

Dr. Howard related several interesting cases to show how men of acknowledged skill could be deceived in their diagnosis of abdominal tumours, even when fluid had been drawn off and examined, Spencer Wells having been thus deceived four years ago. The fluid presented the characteristics of ovarian, as examined by Knowsley Thornton, and yet came from a fibro-cystic tumour of the uterus. Dr. Howard aspirated a tumour, the contents of which did not coagulate, and he believed it to be ovarian, as taught by the late Dr. Atlee. It proved under operation to be a large pediculated uterine fibroid undergoing cystic degeneration. He quoted Dr. Peaslee's remark: "Whoever aspirates an ovarian cystoma should be prepared to do ovariectomy in twenty-four hours."

Dr. Drysdale had tapped repeatedly, but could not recall a case in which a fatal result followed: he had seen it in the practice of others. He tapped in bed under the compression of a binder, and drew off all the fluid, as he believed it dangerous to draw out only a portion. In a woman tapped fifty-two times with bistoury and catheter, he found very few adhesions when removing the tumour.

Dr. Chadwick spoke of the danger to be apprehended when pus was found in the fluid, and the importance of removing the tumour to save the patient from the risk of rupture, escape of the fluid, and collapse. In one case he found after death, indications of ulcerative action in the lining of the cyst walls.

Dr. Noeggerath had sent a specimen of fluid to two of the best men in the country, who answered that it contained the ovarian corpuscle. It was taken from a suppurating cyst of the thigh. He considered the corpuscle as the fatty degeneration of a nucleus. The cyst of the broad ligament might be the development of a Wolffian body, or of the ovary itself, and the former could develop into the abdominal cavity constituting an intra-peritoneal parovarian cyst. A cyst of the broad ligament may therefore contain parovarian limpid fluid, or true ovarian fluid. Hence the fluid obtained by tapping is not to be relied upon as a distinguishing test for an ovarian cyst or one located in the broad ligament.

It is very evident, that aspiration of abdominal cystic tumours is far from safe. Care may enable an operator to escape producing death in a large number of cases, but no skill will enable him to escape the occasional opening of a bloodvessel. To tap a hydro-nephrosis, a hydatid cyst, or a sac containing pus, is far from safe, although valuable as a diagnostic measure. There may be no blood lost, but the escape of noxious fluid is almost equal in danger.

Notes on Cases of Pelvic Effusion resulting in Abscess, by G. H. LYMAN, M.D., Boston. The cases given in abstract, numbering forty-one, upon which this paper is based, were treated by the author and his colleagues in the City Hospital of Boston from 1875 to 1880, inclusive. In this period, there were one hundred and forty-six cases of pelvic effusion under treatment, of which the forty-one selected, either were at the time of admission, or soon became, the subjects of pelvic abscess. The object of Dr. Lyman is to demonstrate the importance of an early tapping of these abscesses per vaginam, and treating them by syringing with dilute carbolic acid and other washes; drainage, and antiseptics; thus preventing them from opening into the bladder, rectum, or at the groin; diminishing the risk to the patient; and shortening the time of cure. Of the forty-one cases, the pus escaped by an opening made spontaneously into the rectum in eleven, and into the vagina in only three. The following are important directions.

“The mere presence of effusion, it need hardly be said, is not of necessity an excuse for operative interference. A large majority of the peritoneal and cellular forms are unquestionably absorbed.”

“Too early interference with a hemothecoele or an extra-uterine cyst may induce the very conditions it is our object to avoid.”

“Where the diagnosis is positive,” of the existence of pus, “the rule of treatment seems to me to be clear; and in obscure cases, an early solution of the doubt where practicable, is of the highest importance.”

In cases of doubt, Dr. Lyman recommends the use of an aspirator needle, as fine as that of a hypodermic syringe, and is opposed to the plan

of waiting until the presence of pus is an absolute certainty. Where there is an opening into the rectum, a counter opening if practicable should be made into the vagina, as this will secure a much better drainage and hasten the contraction and obliteration of the rectal fistula.

"In all cases where the discharge is offensive, a prompt subsidence of pain, temperature, pulse, etc., will generally follow a careful washing of the cyst by injection of carbolized water, or solutions of permanganate of potash, and if the discharge shows no disposition to diminish, the direct application of tincture or iodine hastens the ultimate cure by its action on the pyogenic surface. The danger from ruptures, if the injections are prudently made, is less than that which the patient incurs from exhaustion."

"If the discharge be inodorous, injections of the cyst are to be used, if at all, with even more caution, and at longer intervals, as the repeated distension of the sac may interfere with its contraction, or even cause a rupture at some thin point and escape of irritating matters into the surrounding parts."

We have made an analysis of the 41 cases presented in the table, and find that there were 28 married and 13 single women. Of these, 32 recovered and 9 died. Aspirated *per vaginam* 24 with 22 recoveries; burst into rectum 7, with one death; burst into vagina 4, with one death; not opened by instrument or spontaneously 5, with four deaths; opened spontaneously into the groin and rectum 1, died; spontaneous opening into vagina and rectum 1, recovered.

Genital Renovation by Kolpostenotomy and Kolpoecpetaisis in Urinary and Fecal Fistules, by NATHAN BOZEMAN, M.D., New York. In commencing this 42-page monograph, the author writes: "Genital renovation, or genital anakainosis, as opposed to genital kleisis, particularly by kolpostenotomy and kolpoecpetaisis in urinary and fecal fistules, without interfering with the functions of the organs involved," is the title in extenso of this paper.

As this article abounds in technicalities, it can only be understood by a very careful reading, and should be illustrated to be made intelligible to the ordinary reader. Dr. Bozeman has acquired a European fame by his work at home and abroad, in restoring the proper integrity of the female bladder and rectum, with their relations to the uterus and vagina; his ingenuity and skill have long been recognized. He has for years been opposed to the methods of treating vesico-vaginal, utero-vesical, and utero-rectal fistulæ by any of the processes which shorten the anterior wall of the vagina, or turn the cervix into the bladder or rectum, or close it, leaving the fistula still communicating with either. He has been very successful in healing such fistulæ after preparatory dilatation, and by splitting up the cervix to the fistule, before closing by sutures. His records of operations in the hands of others, particularly in Europe, show the disastrous effects of permitting the urine to collect in the vagina, or uterus, and the uterine discharges to escape into the bladder, etc.

There was no discussion of the paper. Genital *Anakainosis* or restoration, the second part of the monograph, is yet to be presented.

Forcible Elongation of Pelvic Adhesions, by ELI VAN DE WARKER, M.D., Syracuse, N. Y. The cases upon which the author proposes to operate, are those of retro-uterine perimetric adhesions; and he describes his method as follows:—

"The patient is etherized, and with any convenient uterine dilator, the cervical canal is forcibly dilated sufficiently to admit the sound. This requires but a moment. The sound which I used was a rude one, which I made myself. The uterine point is blunt, and 2.7 cm. in circumference, and curved upon a radius

of 8 cm. The sound is introduced with the curve backward or forward whichever way it is most easily forced. Before making extension upon the adhesions, the curve is rotated forward if necessary. Firm, steady traction is then made, moving the uterus directly forward, and having reached the limit to forward movement of the whole organ offered by the pubic arch, the fundus is tilted forward so that it is protruded above the pubes. This done, the limit to forward movement of the uterus is reached, and consequently the adhesions can be elongated no further in this direction; but while the extreme anteversion of the fundus is maintained by a steady hand, we can force the uterus upward and forward about an inch further, and put the adhesions on a further stretch. It is well to introduce the finger into the rectum to ascertain the relation of the adhesions to the rectal wall during elongation. If sudden force is put upon the adhesions the rectal wall seems to follow the uterus; but, if a firm, gradual force is applied, the tension produces but a slight effect upon the near parts."

"By forcible elongation, the only result that is of any benefit to the patient has been gained; pain and tenderness have been relieved by removing the strain of the adhesions upon the hyperemic and sensitive surfaces. The direct result is, that absorption of the inflammatory product is resumed, and the exemption from pain allows nutrition to be restored. If the adhesions contract to the extent of renewal of the old symptoms, it would be better to repeat the operation after an interval of two or three months, than to make the useless attempt of preventing it by mechanical support."

Four cases are reported by the author. In No. 1 the mobility of the uterus was restored. No after-treatment required. In No. 2 pelvic pain followed, with slight fever: rest, fomentations, vaginal irrigations, and opium required. Partial restoration of mobility; pain in defecation relieved. No. 3 same result as in No. 1. No. 4, operation followed by chill, pelvic pain, and tenderness; temperature 104°. Three weeks' active after-treatment required. No improvement by the operation.

The reading of this paper was followed by a long discussion, the report of which occupies more space than the article itself, and was participated in by Drs. Mundé, H. P. C. Wilson, Jackson, Lyman, Engelmann, Boze-man, Chadwick, Campbell, Smith, Sims, and Goodell. There was a general opposition to the method proposed, which was regarded as not only dangerous in its effects, but unlikely to accomplish any good result. The discussion was made to embrace a much wider range of cases than Dr. Van De Warker proposed to treat; his design being not so much to replace a retroverted uterus, as to relieve pain by increasing its mobility.

Lupus or Esthiomène of the Vulvo-anal Region, by ISAAC E. TAYLOR, M.D., of New York. The destructive power of *lupus exedens* is well known, from its frightful ravages upon the human face: it is not any less active when seated upon the female genitals; eating away the vulva; opening the vagina and rectum into one, and destroying the floor of the bladder. Much less frequent than upon the face, and not usually well understood, it is commonly confounded with syphilis and treated as such. It may be associated with this disease, but is a perfectly distinct malady, and differs decidedly in certain features from it, scrofula, and cancer. *Lupus exedens*, under the names of rodent cancer and rodent ulcer, has often been considered malignant, and to belong to the family of cancers; but latterly it has been more distinctly defined, and proved to be local in character and in many instances curable. Not affecting the neighbouring glands, and, being confined to the tissues immediately involved, the parts beyond the line of ulceration are healthy; and these facts have led to a plan of successful treatment, which is based upon the rapid destruction by fire or acids of the parts diseased, thus converting the lupus ulceration

with its disposition to spread, into one of a healthy character, inclining to granulate and heal.

Dr. Taylor's paper is based upon a record of seven cases of lupus in different forms, which are all that he has noticed in a long period, although having superior opportunities for observation in several public institutions. This shows the extreme rarity of lupus in the peculiar location treated of. But for the fact that this is the seat of specific ulcerations, and that lupus thus located is apt to be attributed to contagion, there is no doubt that it would be more frequently recognized when it does occur. The differential diagnosis is not an impossible one when the attention of the physician is drawn to the fact, that all ulcerative diseases of the genitals in young women are not of syphilitic origin, and he is thus led to consult the pages of a good dermatological work. The pathological nature of the disease is somewhat obscure, and appearances vary with the tissue, whether it be skin or mucous membrane, under examination; the microscopical appearances may in some instances be confounded with those of epithelioma. The diagnosis must be made up by comparative tests, and an examination of the case in all its points, whether of history, appearance, etc. Dr. Taylor defines the discharge, in the forms where it does occur, as "of a pale-reddish, viscid nature," with "but little odour, and seldom great in quantity." "The part from which the pus or fluid is produced is covered by a thin pellicle."

The cases described by Dr. Taylor were: 1. "*Lupus serpiginosus, or extensive superficial lupus of the whole of the vulva.*" 2. "*Lupus promincus of the tumour form; very narrow and thin hypertrophy of the labia majora.*" 3. Of the same variety. 4. "*Extensive hypertrophy of the clitoris and labia minora in length; destruction of the vulvo-anal septum; dissection of the cellular tissue all around the rectum, with procidentia recti.*" He gives a list of 21 cases, viz., by Huguier 9, West 5, and his own 7. Of these, 6 were cured, 7 relieved, 4 not relieved, and 4 died, one of them (West's) under chloroform.

Of the cause of death, Dr. Taylor remarks: "The destruction of life is not effected, as in cancer, on some distant organ. Death follows from an affection of the intestine, by diarrhœa, or by the prolonged continuance of the disease, and sometimes by perforation of the bowel consequent on the contraction which exists between the rectum and vulva, whose tissues have become infiltrated and callous by the disease."

Treatment.—This is mainly local and surgical. If any constitutional conditions exist, these must be met by appropriate remedies. Of these last, the author prefers calomel, in doses of $\frac{1}{25}$ to $\frac{1}{30}$ of a grain, and "Donovan's solution," in five-drop doses, gradually increased to seven or eight. For the superficial or serpiginous form, he applies the acid nitrate of mercury, and sometimes pure nitric or acetic acid. Unguents are to be avoided. Iodoform is dusted on occasionally. He has used the curette gently in two cases. The brown-red cautery was applied occasionally, followed by the biborate of soda or the acetate of lead, with or without opium. In the tumour-like form, the early treatment was simple, as above; if this failed, the elevations were excised with his *crushing scissors*, the cutis being first incised around to prevent its being drawn into the instrument, and adding to the suffering. After amputation, the brown-red cautery is to be applied, and then the borax or sugar of lead, as above. Dr. Taylor prefers the milder escharotics and low-heated cauteries in treatment; he has never used the white-hot cautery in lupus.

Dr. Byrne said he had had to treat such cases quite frequently, and did it, with the galvano-cautery; he claimed very good results therefrom. He believed that to produce a cure, the substructures and immediately adjoining tissues should be burned out. He used no medical treatment or attempted to cure by topical applications. Dr. Kimball was of the same opinion as to the proper method of treatment.

Bursting Cysts of the Abdominal Cavity, by WILLIAM GOODELL, A.M., M.D., Philadelphia. This paper is based upon a record of three cases, believed to be parovarian or extra-ovarian, in which the cysts were inclined to burst spontaneously on account of the thinness of their walls, and then rapidly refill. An outline of the report of case No. 1 will exhibit the nature of the disease. Mrs. X., aged 46, mother of three children, came under observation on July 26th, 1879; presented a fluctuating tumour as large as an adult head in the lower abdomen and in front of the uterus. Sept. 25th, aspirated the tumour, and removed nearly eight quarts of fluid stained with blood, which, on examination, by Dr. Formad, was believed not to be ovarian. Oct. 6th, cyst rapidly refilling. Nov. 8th, went by appointment to tap the cyst; patient suffering with colicky pains; no tumour discoverable; cyst had burst whilst stooping, about an hour before. For a few days there were abdominal soreness and excessive urination. Jan. 21st, 1880, tapped, $10\frac{1}{2}$ quarts. Feb. 13th, a second spontaneous rupture. Tapped on March 21st, April 21st, May 18th, and June 8th, removing 8 to 11 quarts each time. Went to the country for the summer, where she was twice tapped, and had two burstings. Returned to the city; tapped Nov. 6th and 29th; removed the tumour on Dec. 18th, 1880; recovered without any bad symptoms. The cyst was decided to be parovarian; there were 4 ruptures and 10 tapplings. The fluid removed was not like the ordinary colourless, limpid contents of parovarian cysts, but had a greenish cast.

While ordinary parovarian cysts develop slowly, and may be permanently, or for a long interval, cured by tapping; the bursting cyst has a tendency to fill rapidly and repeatedly, as in this instance. The true ovarian cyst may burst by pressure or ulceration, and it is apt to result fatally in consequence of the irritating quality of the fluid setting up a violent peritonitis. Dr. Goodell remarks, that it is reasonable to infer, that when a cyst bursts and the patient recovers, it is one of the broad ligament rather than the ovary. Dr. Agnew once removed an ovarian tumour which had a small hole in it, as if cut with a punch, through which a large proportion of its contents had escaped into the abdominal cavity.

In the discussion which followed the reading of Dr. Goodell's paper, no less than thirty-one cases of a similar character, some evidently ovarian and others parovarian, were related by Drs. Chadwick, 1; Barker, 1; Kimball, 9 or 10; Dunlap, 7; Sims, 4; Garrigues, 1; H. P. C. Wilson, 1; Drysdale, 3; Reamy, 2; and Kinlock, 1; = 30.

Erysipelas in Childbed without Puerperal Peritonitis, by HENRY F. CAMPBELL, M.D., Augusta, Georgia. The author reports one case in illustration, which was brought to his notice on June 9th, 1872, at which time the woman was about eight months pregnant, and was the subject of severe erysipelas of the face. She was placed under treatment for this, and among other remedies took quinia to cinchonism; she was delivered under the care of a midwife on June 14th, of a well-developed, but feeble and jaundiced fœtus, which died on the fourth day. She was kept under the quinia a week longer (10 grs. per diem); her erysipelas gradually

disappeared, and she was out of bed on the ninth day, having escaped all puerperal complications due to the erysipelas. Dr. Campbell reported a second case in contrast, which was in the care of two physicians of Augusta, and resulted fatally. The subject was far advanced in pregnancy when attacked with severe facial erysipelas, and labour came on prematurely in a few days. After delivery, she was attacked with puerperal peritonitis and died. In the former case Dr. Campbell did not *touch* the woman, and the midwife made no *manual contact*.

Dr. Mary Putnam Jacobi accounted for the escape of Dr. Campbell's patient from puerperal peritonitis by "the fact, that erysipelas is primarily a disease of the lymphatic system, and may be confined to that system without the blood becoming affected; consequently there being no particular connection, anatomically, between the erysipelas of the face, and the uterus, the wounded surface of the latter was not really exposed to the poison."

Dr. Goodell had seen two cases in which erysipelas broke out a very short time after labour, both of which recovered: he "attributed the recovery to the fact that the erysipelas was, as it were, a cutaneous explosion, which kept the disease from affecting the internal organs."

Dr. Smith had charge of one of the cases referred to by Dr. Goodell. It was phlegmonous in character, and developed in one or two days after confinement, the nurse having the disease. The parts involved were the right natis and thigh, the abdomen, both sides of the vulva, and finally more than two-thirds of the surface of the body, in some parts of which the supuration was profuse. There were no evidences of puerperal peritonitis. Dr. Smith made no vaginal examination; and by the aid of disinfectants applied to his hands, was enabled to deliver three women with safety during his attendance. He thinks this case gives evidence "that puerperal fever is essentially contagious and not infectious."

Dr. Lyman delivered a woman that made a good recovery, who had erysipelas, and her husband, who occupied the same room had at the time a bad attack of phlegmonous erysipelas. He was inclined to account for the escapes of puerperal women affected with erysipelas on the basis given by Dr. Jacobi.

Dr. Ellwood Wilson had great faith in the power of disinfectants to prevent the communication of the poisons of erysipelas or scarlet fever to a lying-in woman. He had been in the habit of using permanganate of potash and carbolyzed oil; and had often been obliged to attend cases of scarlet fever in children, and labour cases on the same day. He had no recollection of any unfavourable result, except in one forceps case, where the instrument was applied high up. This patient had septicæmic symptoms, but recovered.

Dr. Barker held the same views with Dr. Jacobi. He had seen an epidemic of erysipelas when a young man, in eastern Connecticut, which was then known as the black tongue. "One of the nurses who attended upon a patient sick with erysipelas, afterwards was engaged to attend a lady who resided eighteen miles from any person who had had erysipelas or puerperal peritonitis. That lady was confined without accident or complication, and the second day afterward was attacked with a very severe form of puerperal fever, and I was sent for. She died, and the doctor who attended her died five days afterward with erysipelas, and the nurse after nursing the doctor was attacked with erysipelas and died." "There is a class of cases of erysipelas in which the disease affects simply the

tegumentary part of the system, and its poison is not transferred to any of the organs or tissues within the body." Dr. Barker believes in the great danger of communicating contagion from erysipelas with purulent discharge; but is of the opinion that superficial erysipelas is much less easily conveyed.

Expansion of the Bladder over the surface of Abdominal Tumours and its attachment to them or to the Abdominal Walls, as a complication of Laparotomy, by T. GAILLARD THOMAS, M.D., New York. Prof. Eustache, of Lille, France, published a 32-page monograph in 1880, upon injury of the urinary organs during the operation of ovariectomy, in which he presented ten cases, one of which, his own, was of the class here described by Dr. Thomas, and he was so fortunate as to save the patient. Besides this case he mentions six others, of which four died and two recovered. The operators were Mr. Henry Smith, 1; Mr. Spencer Wells, 2; and Granville Bantock, 3. Dr. Thomas presents an additional record of eight others, one his own, and all American but three. He describes the complication as "an apron-like spread of the bladder, which is trebled or quadrupled in size, over the whole anterior surface of the tumour, from the umbilicus, or a point above it downward to the pelvis." The attachments are not such as are usually encountered in the adhesions of ovarian cysts, but are so firm and intimate, as to require more force to tear them loose, than the strength of the bladder will bear without itself becoming lacerated. The condition is accounted for in this way: the bladder becomes adherent when the tumour is small, and, as it grows, it is drawn gradually upward, and in some instances also laterally, until it may cover all the line of the incision in a laparotomy, and spread over all the parts felt under the hand in exploring the surface of the tumour. In other cases, and perhaps more frequently, the bladder is only elongated, and may resemble in form the skin of a large sausage. In either case, there is great danger that the bladder may be transfixed by the trocar, and the patient lose her life in consequence. The tension upon the bladder is believed to act as a stimulus to the adhesions, so that they grow more and more dense until they can only be separated by a careful dissection.

The record of cases given by Dr. Thomas is as follows:—

1. Dr. Bergman (*Petersberger Medicinische Zeitschrift*, 1869). Incision from an inch and a half below the umbilicus, to three inches above the pubes; bladder opened in cutting through the peritoneum; this viscus was long and narrow as already described. The tumour was a polycyst and could not be removed; the bladder-wound was closed with silk sutures cut short; patient died in thirteen hours.

2. Dr. B. Stilling (*Deutsche Klinik* for 1869). No peritoneal cavity distinguishable; trocar punctured the bladder, which was much elongated and pushed over to the left side. Tumour, an ovarian polycyst, and only partially removed; bladder-wound closed with silver wire; death occurred in fifteen minutes.

3. Mr. Richard Neale, London (*Med. Times and Gazette*, November 28, 1868). When the peritoneum was opened, the appearance presented was that of another layer of altered serous membrane covering the tumour. In consequence of dense and universal adhesions, the operation was abandoned and wound closed. The next day urine escaped through the wound and the bladder was found incised for an inch and a half. At the end of twenty-six days there being a urinary fistula remaining, the abdominal wound was opened, bladder pared, and sutured with fine wire, and exter-

nal wound closed. A small fistula remained. Patient died of the tumour, which proved to be a hard fibroid, in six months; bladder long and narrow, eight inches, by one to one and a half.

4. Dr. Montrose A. Pallen, St. Louis, Missouri, 1868. An attempt was made to perform ovariectomy, and after the cyst was emptied it was found impossible to overcome the adhesions to the bladder, rectum, etc. The cyst walls were stitched to the edges of the abdominal incision, and the attempt abandoned. The patient died on the fifth day, of diffuse peritonitis; and complete adherence of the cyst to the bladder, uterus, and rectum was found of such a character that it could not be overcome. The bladder measured fully nine inches in length, and almost as much in width.

5. Dr. X., assisted by Dr. T. G. Thomas. The operation was one for the removal of a large uterine fibroid. A shining muscular-looking mass covered the tumour and reached as high as the umbilicus. Believing this to be false membrane, it was peeled off from above, and when he reached the pubes he discovered that he had separated the anterior wall of the bladder. Quickly detaching the balance, the rent was sewed up; and the tumour removed. The patient died in a few hours.

6. Dr. Leroy McLean, Troy, N. Y. (*Medical Record*, Feb. 8, 1879). The case was one of multilocular cyst which was aspirated prior to the operation. An incision of the abdomen was made, and the tumour removed, after which it was discovered that the bladder, which was united to the abdominal wall, but not to the tumour, had been incised. The bladder was sutured with interrupted stitches of silk, and the abdominal wound closed with silver wire. Patient died in thirty hours: highest temperature $101\frac{4}{5}^{\circ}$; secretion of urine normal.

There were no evidences of peritonitis; bladder healed up; no escape of urine into abdominal cavity; adhesion of bladder to abdominal wall so firm that the viscus tore in attempting to separate them.

7. Dr. Noeggerath, New York, at Mount Sinai Hospital, October 18, 1880. He was unable to find any peritoneal coat under the abdominal incision; tapped the tumour and obtained a bucketful of colloid material. Found very extensive adhesions between the mass and the abdominal walls; cut into a cystic cavity which was found to reach upwards to within $2\frac{1}{2}$ inches of the umbilicus; discovered this to be the bladder, which he had opened; and sewed it up with catgut. He then extended the incision above the umbilicus; woman became suddenly pale; found cyst filled with blood; ligated a soft mass in one of the pouches of the tumour and arrested the hemorrhage. Dr. N. ceased operating because of the extensive adhesions and prostration of the patient, and treated the case by drainage. Patient died in twenty-six hours, of anæmia and septicæmia.

8. Dr. T. G. Thomas, November, 1880. In this case the operator was led to suspect that the bladder was spread out over the tumour and intimately adherent to it. He was unable to test its limits by introducing a catheter, but found that it extended above the umbilicus. When thinking of abandoning the case he conceived a plan, by which he might be able to determine the limits of the bladder, and by this dissect it free from the tumour. Opening the viscus so as to introduce one or two fingers, he found it quite easy to determine the bounds of the bladder, and by dissection and breaking up adhesions, to separate it from the tumour to which it adhered, only at its circumference. Quite a number of vessels required ligation. The tumour was then tapped, removed, the pedicle ligated and

dropped in. The bladder reached to a point midway between the umbilicus and ensiform cartilage, and well into each lumbar region. In dressing the wound of the bladder, Dr. Thomas inclosed it in the walls of the abdominal incision, so as to secure an external escape for the urine, if there should be any. He thus describes the method employed.

“Employing Vidal’s needle, which has an eye near its extremity, I closed the abdominal wound from above downwards, and twisted the silver sutures employed until the wound was closed down to the opening in the bladder. Arrived at this point, I passed the needle through the abdominal wall, then through one vesical wall, then through the other, and lastly through the opposite abdominal wall, and this I continued to do until the whole opening was traversed by sutures. The sutures were then twisted, care being taken to lift the bladder well up to the surface, and the operation was completed.”

The patient made a good recovery, and was up and about on the fortieth day. A minute urinary fistula remained, which was cured by a slight operation.

9. Dr. Gustave Eustache, Lille, France (*Archives de Tocologie*, 1879, p. 393; 1880, p. 277). Operation performed on a woman of 43, on May 14th, 1878.

This case has been overlooked by Dr. Thomas (as were also the six English cases already mentioned). There were extensive adhesions, and the bladder was abnormally elongated. It was incised for three-quarters of an inch at a point four and three-quarter inches above the symphysis, and much urine escaped into the abdominal cavity. This was carefully removed, the bladder sutured with three carbolized catgut stitches, and the catheter used continuously. The patient was up in two weeks, and out in a month. These cases collectively make 15, of which 10 died and 5 recovered.

In the discussion the operation of Dr. Thomas was highly eulogized for its ingenuity, and the skill with which the case was managed. Dr. Kimball reported four cases. First died of exhaustion in seven weeks; second died in four weeks of a parotid abscess; third died rapidly of shock; fourth recovered after several months, having narrowly escaped death. The first and second were fibro-cystic of the uterus, and second and third fibroids.

Dr. Englemann had had two cases of adhesion of the bladder, both of which made good recoveries. One narrowly escaped being cut into; the other was a Freund operation for cancer, in which the bladder was *probably open*. There is a little obscurity in the reports of the two cases.

Dr. Goodell reported one case of wounded bladder in an extirpation of an immense fibroid. The patient died of shock and loss of blood in a few hours. The reviewer saw this case, and believes the bladder wound added but little to its fatality, as it was of sufficient gravity without it.

Dr. Drysdale had met with adhesions of the bladder in abdominal tumours, but had thus far escaped wounding the organ.

We have seen a case of this form of injury quite recently, under Dr. W. F. Atlee; the bladder was drawn out into a long process, and obscured by adhesions; and a collection of small overlying cysts. The patient has recovered.

We have, in all, here recorded 22 cases in which the bladder was wounded of which 14 died and 8 recovered.

Fibroid Polypus, with Partial Inversion of the Uterus, with Specimen, by THADDEUS A. REAMY, M.D., Cincinnati, Ohio. The subject of this record was a virgin of 28 years of age, the daughter of a farmer in com-

fortable circumstances. She was well developed and healthy as a young girl; commenced to menstruate at sixteen, and was regular up to twenty-five, when gradually her flow increased in quantity, became prolonged in duration, and finally at times hemorrhagic. In the intervals she had an irritating discharge, and suffered with abdominal and pelvic pains. Her health failed; she became pale and emaciated; had a bad cough, and during the year before Dr. Reamy saw her spent most of her time in bed. She was placed under his care on June 15th, 1881. In February, 1881, she was seized with pains like those of labour, which gradually became paroxysmal and expulsive in character. After eight or ten hours she had a long expulsive pain followed by a copious hemorrhage; then fainted; and when restored to consciousness was comparatively free from pain, but had a sense of distension in the pelvis and perineum, with pressure on the bladder and rectum. The physician detected a tumour in the vagina, and concluded that it was either an inverted uterus or fibroid, but probably the latter. Under astringent injections, tonics, and generous diet, the patient was at last able to go to Cincinnati, one hundred and fifty-six miles, by railroad.

Dr. Reamy found a hard tumour in the vagina, which so blocked it up that a satisfactory exploration was impossible. Its size was computed to be nearly that of a foetal head at term, and it could only be moved upward very slightly, and under considerable pressure. It was not sensitive, but bled on the slightest touch. Under ether, with the fingers in the rectum and other hand above the pubes, the fundus uteri appeared to be ovoid, and no cup-like depression could be detected. By the vagina, it was found that the os encircled the pedicle, which was very short and about two inches thick. The diagnosis was established that the case was one of fibroid polypus; but the partial inversion of the uterus was not detected.

The chain of an *écraseur* was then passed around the pedicle and tightened, until, having a twist in it, it fortunately broke, which saved the fundus uteri from being cut through, as there was virtually no pedicle, the top of the uterus being imbedded into the tumour. The *écraseur* failing, the polypus was removed in portions by scissors, and the parts then examined per vaginam. The sound entered one and a half inches; the pedicle was convex, and of a different tissue from the tumour, and the diagnosis was now clear. The uterus was readily examined with hand in the vagina, and the inverted portion replaced. The patient was kept in bed a week, and was well enough to go home in ten days. She has perfectly recovered.

Dr. Sims reported two cases, in which the tumours were first delivered by incising the perineum, after which they were removed by enucleation.

Dr. Barker had operated upon a number of cases, and had frequently been obliged to partially invert the uterus in their delivery. One case he had delivered with the forceps, having first incised the perineum on each side. These incisions extended, but the median line of the perineum was saved. The tumour had a short pedicle, two and a quarter inches thick, which was easily recognized by the difference of colour. It was almost as hard as cartilage, and, when cut through with the scissors, the relieved uterus sprung up into its natural form (with an audible sound), with the exception of a slight depression at the fundus. The patient made a good recovery.

Dr. Goodell related his experience with a case similar to that of Dr. Barker. The lateral incisions did not save the perineum, as the subject

was unmarried; he enucleated the tumour very readily, and then sewed up the perineum. The patient recovered perfectly.

Dr. Byrne preferred the use of the galvano-cautery for the removal of this class of tumours.

Dr. Mary Putnam Jacobi recommended the employment of the serrated scoop of Dr. Thomas, and had found it very useful in one case; there was rarely any danger of hemorrhage to require the use of the *écraseur* or cautery-wire. She found in her case that "the surface of the tumour" was "occupied to a considerable depth with embryonic tissue, identical in appearance with the embryonic cells found under the epithelium of the uterus."

Dr. Reamy had encountered quite profuse hemorrhage in some cases, and had seen large bloodvessels in the pedicle. He believed that there was a change in the vascularity of the pedicle in cases where the polypus had been long expelled into the vagina. It was not uniformly correct that the bloodvessels were confined to the mucous membrane.

Axis Traction with the Obstetric Forceps, by ALBERT H. SMITH, M.D., Philadelphia. This paper is designed to show that it is not necessary to employ a specially constructed instrument, such as Tarnier's, to produce traction in the curved line which represents the axis of the pelvic canal; but that this can be accomplished with a properly contrived and fitted instrument, such as that of Davis, by applying the power to the handles, so as to make them act as a lever of the first kind, after the manner originated by Osiander in 1799, and taught in the Philadelphia Lying-in Charity since 1827. This consists in making the left hand act as a fulcrum over the lock of the forceps, and bear downwards and backwards upon the direction of the head, while the right hand forces the handles upwards and forwards; the two antagonizing forces causing the blades of the forceps to describe a curve within the pelvis, in the proper line of the passage of the foetal head in natural labour.

Dr. Smith shows that the idea which prompted Prof. Tarnier to design his forceps was not an original one, but had been acted upon by Hermann in 1844, Hubert in 1869, and Morale in 1871. Tarnier probably did not know of their instruments; nevertheless his was not the first to be employed as a direct axis-tractor for the superior strait. He (Dr. Smith) had never made use of the Tarnier forceps, as they were very limited in their applicability, and he could accomplish all that they were designed for by the instrument of Davis, at any point in the pelvis from the superior to the inferior strait.

Dr. Smith, who believes in applying the forceps, as a general rule, to the sides of the foetal head, claims that Tarnier's cannot be applied at the superior strait in an oblique direction without being made to act in an improper manner as an axis-tractor. He believes the instrument to be cumbersome when applied at the superior strait, and dangerous, requiring removal, when the foetus descends. He claimed that the Davis forceps could be employed as an axis-tractor at all points with safety to the foetus and mother, and did not require removal as the head reached the perineum.

The reading of this paper gave rise to a very long discussion, in which it appeared that the general opinion was quite in favour of the Tarnier instrument, which was regarded as an invaluable improvement in the obstetrical armamentarium.

Drs. Lusk, Barker, Howard, J. E. Taylor, and T. G. Thomas spoke

warmly in favour of the instrument, and Drs. Reamy and Ellwood Wilson sustained the side of Dr. Smith.

It is impossible to do justice to the long and able paper of Dr. Smith in the space allotted us, as the article is of a peculiar and argumentative character, and can only be appreciated when seen entire and carefully read. It occupies 22 pages, and the discussion 13. Having been taught according to the principles advocated by Dr. Smith, and believing them to be correct upon scientific and mechanical reasoning, we are glad to see that he so ably and earnestly advocated them before a body which he knew by experience would advance opposite views. The Philadelphia schools of obstetrics, since the day when Dr. Davis sent Dr. Meigs a pair of his forceps, and Dr. Hodge designed those which bear his name, have taught that these instruments should be introduced with reference to the position of the child's head and applied over its sides. Teaching thus, it is easy to comprehend why these instruments are believed to answer the purposes of axis traction under the method of use designed by Oslander.

Jaundice in Pregnancy, by J. W. UNDERHILL, M.D., Cincinnati, Ohio. As pregnancy is a predisposing cause of jaundice, and the complication is liable to prove fatal, *icterus gravidarum* is a subject of much interest to the obstetrician. This is well set forth by the author in his record of cases, which we give in a few words.

1. *July 13, 1867.* Subject married; seven months pregnant; early symptoms malaise, anorexia, and constipation; jaundice appeared in a few days; slight at first, then rapidly became intense. Vomiting began on July 12: first mucous, then bloody, and at night noisy delirium commenced. Hemorrhages from the intestines and bronchi occurred; abortion on the next (July 13) day, with an unusual loss of blood; child stillborn and not icteric. When Dr. Underhill saw her she was comatose, and ecchymoses were appearing; no hepatic dulness discovered; spleen seemed enlarged; temperature but slightly raised; pulse 150; respiration 25, and stertorous; urine reddish-yellow; non-albuminous, 1.023. Died in nine hours after the visit, and twelve days from first manifestation of disease. No autopsy. Diagnosis, acute atrophy of the liver.

2. *April 18, 1874.* Mrs. W., multipara; delivered under care of a midwife, after an easy labour, of a healthy child. Local peritonitis occurred soon after parturition, from which she appeared to recover. About May 9, a free bloody discharge came from the vagina, with faintness, anorexia, and vomiting. May 10, called in; violent chill followed by sweating, on the previous night; temperature at visit, 104.5°; pulse 120; vaginal discharge offensive, sanguinolent, and profuse. Abdomen very tender to palpation; detected the remains of the exudation produced by the peritonitis. Pyemia had developed from this local deposit of putrescent matter. Septic poison continued eighteen days, with chills and sweats at intervals. Respiration 20 to 50; pulse 74 to 129; temp. 100 to 105.5°. On tenth day slight tenderness in the hepatic region, which increased greatly in 24 hours. On twelfth day, tinge of general jaundice, which increased during May 13 and 14. Died on May 27 of pyemia, eighteen days after its development, and thirty-seven days after parturition. Liver found "honey-combed" with small abscesses; spleen contained several pus cavities.

3. *June 20, 1875.* Mrs. L. S., primipara; when called in found she had been jaundiced four months; confined to the house for the first three, and much of the time in bed during the last month. She was weak,

emaciated, intensely jaundiced, had had dysentery for two days, was eight months pregnant, and had premonitions of labour. During her four months' sickness her bowels had alternated between diarrhœa and constipation; stools clayey, urine coloured with bile, and stomach deranged. There was increased hepatic dulness, and itching of skin. Labour came on in two days, child alive, not jaundiced, apparently eight months, had double talipes varus, and is still living at the age of six years. Mother slowly convalesced; out of bed in two weeks, free from icteroid hue in three weeks.

4. *August 2, 1876.* Same patient; jaundice much less severe, no fever or symptom of gastro-enteric catarrh; not confined to recumbent posture; urine clouded with bile, stools deficient in biliary matter, bowels confined. Diagnosis, mechanical compression of ductus communis choledochus, with, perhaps, fecal accumulation in colon. Purged with calomel and used simple measures; jaundice disappeared in eight days. Labour came on in five weeks; child healthy. In a third pregnancy there was no jaundice.

Dr. Underhill believes that acute yellow atrophy of the liver is a much more common cause of jaundice and death, in pregnant women, than it is usually presumed to be. Abortion almost invariably occurs, and the infant is found free from the icteric tint, although the liquor amnii may be well tinged. He believes that pregnancy adds to the dangers of the disease, and doubts if a woman has ever been known to recover from the combined condition. Jaundice appears much earlier in pregnancy where there is atrophy of the liver than where the cause is one of mechanical pressure from the enlarged uterus. "Catarrh of the biliary ducts and lining membrane of the duodenum incites sometimes comparatively early in utero-gestation a form of jaundice, as in Case 3, which, on account of its early development, may suggest malignant jaundice." The characteristic features of the atrophic variety are given as follows: Noisy, violent delirium, usually followed by convulsions, then stupor and coma; respiration sighing, intermittent or stertorous, the pulse quick before the development of jaundice, slow after its appearance, and very quick again as coma deepens; vomiting of "coffee-grounds," hemorrhages, and petechiæ, ecchymosis, rapid diminution of area of hepatic dulness and corresponding increase of that of the spleen.

Jaundice, as a complication of pregnancy, may arise from causes other than those already named, viz., stenosis of the ductus hepaticus, and communis choledochus, mental emotion, typhus, and malarial fever. We cannot see in many of the records of groups of cases *called* epidemic, any evidence of ununiformity of origin, and believe them to have been due to various causes, their prevalence as an apparent epidemic would seem to be simply accidental. In malarious districts, jaundice has in *rare* instances appeared as an epidemic.

The Practice of Gynecology in Ancient Times, by EDWARD W. JENKS, M.D., LL.D., Chicago, Ill. This is a historical paper of 45 pages, which has required a great amount of labour and research, appended to which are some illustrations proving that the speculum and female catheter were in use more than eighteen hundred years ago, and possibly before the Christian era. The Pompeian instruments were carefully sketched by the reviewer in 1856, and differ somewhat from those in Dr. Jenks's plate. The trivalve speculum uteri of Pompeii, appears to have been known to the medical world through some extraneous source, as almost identical

instruments were in use by Paulus Ægineta, and Ambrose Paré, and appear in illustration in Heister's Surgery. The bivalve pattern of Pompeii is still in use, but is employed for exploring the rectum. Although buried from A.D. 79 to 1818, the Pompeian specula appear to have been well-known in the third century, sixteenth (1575), and a hundred and fifty years ago. The paper by Prof. Jenks cannot be presented analytically, but must be read in full to understand what ancient gynecologists taught and practised.

Papers presented by Candidates elected to Fellowship in 1881.

These are six in number, and occupy fifty-five pages in the volume of the Transactions. They are entitled as follows:—

1. Can Lacerations of the Cervix Uteri be prevented? By W. M. Polk, M.D., New York.
2. A point in the Management of the First Stage of Labour. By Walter R. Gillette, M.D., New York.
3. The Treatment of Chronic Perimetritis by Puncture and Iodine Injections. By Charles C. Lee, M.D., New York.
4. The Mechanical Action of Pessaries. By Frank P. Foster, M.D., New York.
5. Mania Lactea, with the report of two cases. By Edward Warren Sawyer, M.D., Chicago, Ill.
6. A Contribution to the History of Combined Intra-uterine and Extra-uterine Twin Pregnancy. By B. B. Browne, M.D., Baltimore, Md.

As papers for candidacy are not discussed in the meetings of the Society we have no means of knowing what opinions are held by the Fellows, with regard to the views expressed.

The first two papers are mainly upon the same question: What is to be done or left undone, to prevent or avoid laceration of the cervix uteri? One advocates what the other condemns, leaving at issue the inquiries, viz.:

1. Shall anything be done in the first stage of labour to aid nature in dilating the os uteri?
2. Is it advantageous or dangerous to dilate the os with the fingers?
3. Is it safe or dangerous to slip the rim of the cervix over the head at the close of the first stage of labour.

Dr. Gillette is an advocate of manual aid in the first stage of labour, and after practising the method for fifteen years, feels confident of its utility in preventing laceration of the cervix.

Dr. Polk, on the contrary, says: "At the present day, when haste is the chief consideration in most pursuits, we find in all labours a growing tendency to supersede the process of nature by so-called art. This finds expression in attempts to hasten delivery by forcible dilatation of the os, and more often by the early rupture of the membranes. While both fulfil their object, they directly act to produce laceration."

There are two sides to the question here, as we have been made fully aware before by the discussions in obstetrical societies. Those who believe that nature is competent to carry through the first stage of labour better without aid than with it, attribute laceration in many instances to dilatation with the fingers, or the early use of the forceps. And those who believe that women are no longer in a state of nature by reason of civilization and refinement, deny that she is competent in a large proportion of labours.

Dr. Lee's paper presents his experience with injecting perimetric deposits per vaginam, by means of a hypodermic syringe charged with

Lugol's solution of iodine, at the Charity Hospital on Blackwell's Island, four years ago. He presents the records of eleven cases, which resulted as follows: Cured more quickly and thoroughly than by the ordinary method of treatment, 2; benefited, but not in a greater degree than by the common method, 3; and injured, rather than benefited, 6.

In open pelvic abscess, Dr. Lee has found great benefit from injecting the pus cavity, using the fluid largely diluted; and that it hastened the process of softening the densely indurated deposit around the abscess-wall and quickened its absorption.

Dr. Sawyer records two cases of mania the result of lactation, one of which recovered under treatment in a little over a month, and the other died in four days, when apparently not in immediate danger shortly before. No autopsy.

Dr. Brown's paper is a valuable historical and statistical record of 24 cases of combined intra- and extra-uterine pregnancy, prepared under the interest excited by the case of Dr. H. P. C. Wilson, of Baltimore, operated upon by laparotomy on May 11, 1880.

More than one-half of the cases tabulated belong to the United States. We remember distinctly a twenty-fifth case, but cannot recall the reference. The physician told the woman that she was pregnant with twins, but delivered her of only one foetus. When she recovered and was about the house, she one day laughed at his supposed mistake when he told her that the second child was still there, and that she would find it out some day. About a month later, the cyst gave way when she was at the wash-tub, and she went into a collapse and died. The case is reported probably in one of our old southern journals.

Of the cases left to nature (20) there were 9 women saved, and 7 of the intra-uterine foetuses. There were three primary laparotomies, all fatal to the women, and saving one intra- and two extra-uterine foetuses. One foetus was removed through the vaginal wall; woman saved; and in one case left to nature, the extra-uterine foetus was removed from an abscess pointing through the abdominal wall, by laparotomy, performed five months after the labour.

The extra- and intra-uterine twins delivered under the knife at one and the same operation, by Dr. E. Paul Sale, of Aberdeen, Mississippi, on March 3, 1870, lived respectively six months and one year. The first died of broncho-pneumonia after having recovered from an attack of measles, and the second of measles. (Letter of Dr. Sale, Nov. 17, 1880, to the reviewer.)

R. P. H.

ART. XVII.—*A Treatise on the Science and Practice of Medicine.*

By ALONZO B. PALMER, M.D., LL.D., Professor of Pathology and Practice of Medicine, and of Clinical Medicine in the University of Michigan, Physician to the State University Hospital, etc. etc. Vol. I. pp. 903, 8vo. New York: G. P. Putnam's Sons, 1882.

AMONG the reasons given in the preface for the publication of this work, we find mentioned the fact that foreign works on the practice of medicine are bought extensively by American readers of medicine, and,

therefore, no entirely satisfactory publication on this subject, written by one of our countrymen, exists. Again, it is said that proper treatment of any disease must be based, in a measure, upon considerations pertaining to nationality, surroundings, and habits. Moreover, in Europe books are written by men who rank as consultants, or who are only familiar with the practice of large city hospitals, and who are unfamiliar with the results obtained in the use of medicinal methods with country patients, or with those who manifest merely the initiatory symptoms of disease. The reasons given for writing another work on practice are quite sufficient, it appears to us, provided we shall find in reading the volumes, that the wish to be a public teacher by writing is sustained by the knowledge, experience, and labour which the position sought for demands. The table of contents of the first volume (which alone has thus far appeared) shows that the author intends to burden himself with no very elaborate classification. In fact, we find but three main divisions to what is thus far written: first, a part wholly devoted to considerations pertaining to general pathology and therapeutics; second, a part, which is the largest one (pp. 400), assigned to a description of particular general diseases; third, a part in which certain local diseases are described. Among the latter, those of the alimentary canal and digestive system solely command his attention. In the first two chapters of the first part of this work, we find a good summary of received ideas in regard to definitions and general observations on the nature of disease. Besides, we remark numerous physiological and pathological descriptions, which have evidently been culled with very considerable outlay of thought and industry from acknowledged authorities of our time, but to whom very exceptionally any credit is given for much borrowed material. In fact, in these, as well as in the succeeding chapters of this work, one is forcibly impressed with the almost complete absence of foot-notes, or reference to the works of others, which in a modern work of so general a character appears to us very essential. We cannot afford, as readers of other men's thoughts, to have them assimilated so thoroughly that the primary and true origin of the subject-matter of our study be entirely ignored. Moreover, it should be expected of any one making use of researches laboriously gleaned, that the precise place of these "trouvailles" should be furnished for the benefit of investigators in a similar field. Not to do this, is to carry conviction that the work is either a compilation from works in the hands of most fairly educated members of our profession, or else that its views are in great measure original, which might lend interest to the treatise if prepared merely for a few searchers after novelties, but would detract greatly from its value as a guide for students and junior practitioners. The pathology of inflammation is treated of in thirty-seven pages. In it we find a great deal on this subject, not always told in the best English, but also certain descriptions, which, out of place here, are, in our opinion, not worthy of any place in a dignified exposition of the science of medicine. On page 82, we notice the following lines as being delineative in part of one of the conditions manifested in childhood by an individual with a tendency towards tubercular deposit: "The scapulæ stand out like budding wings, which the prophetic and sentimental say will be angels' pinions soon, to carry them away. They talk philosophy and sentiment in the nursery, almost in the cradle; they are considered 'too smart to live,' and are excellent subjects for Sunday-school story books." The following remarks also, in regard to the use of alcohol, on pp. 85, 86, are also pitched in a

key that is scarcely attractive, and which here, as well as elsewhere throughout this work, decidedly mars its general tone, *i. e.*:—

“The opinion that so *unnatural* an article as alcohol can serve as a condition of normal life in old age as milk does in infancy, is as far from the truth as anything else that is false; and a belief in it has done much harm . . . the opinion is now becoming general in all enlightened medical circles, that alcohol in all its *admixtures* should be regarded, from a scientific point of view, as a medicine or a poison, according to the manner of its use, and should be classed with other drugs.”

Is nothing to be said of alcohol as a food, and are the researches of men of the value of Richardson, Anstie, Sanderson, Brunton, etc., not to be even alluded to when such sweeping affirmations are introduced into a text-book for the beginners in medicine?

In his remarks on the therapeutics of inflammation, the author raises his voice with considerable force and emphasis against the increasing scepticism of our day. He believes that in very many instances we can control the march of inflammatory processes, if curative means are employed sufficiently soon. Moreover, he recognizes in the changes of opinions with respect of medical practice, which each succeeding decade evolves, rather the evidence of men's varying views than the proof that the indications of means of treatment are very different. The general doctrine of fevers is clearly exposed, allusion is made to the views held by the best and latest authorities on the subject of the specific fevers, especially as regards their parasitic origin. Pasteur's views are reported with commendation, and as an outcome of the study of febrile action, its causes, march, and effects, we have developed a classification of fevers. They are divided into—I. Symptomatic; II. Idiopathic: the former including irritative, inflammatory, hectic, pyæmic and septicæmic, catarrhal fevers; the latter non-specific and specific, which are both again divided into numerous sub-classes. The last chapter of Part I. is, also, the most suggestive of this first division of Dr. Palmer's work. In it he treats of several of the minor ailments which affect human beings. The different appearances of the tongue are portrayed, and the remedies for dryness, excessive thirst, inappetence are amply detailed; afterwards we have reference to indigestion, American nervousness, rheumatic pains, bites of insects, capillary hemorrhages, and taking cold and its treatment. The American habit of drinking freely of ice-water is not unduly vituperated, and a pill of quinine, camphor, and belladonna is thought to be useful in allaying the irritation of an acute coryza. In concluding this chapter, the author insists upon a possibility of aborting many diseases by the proper use of drugs, perhaps, indeed, of notably influencing the gravity and duration of several of the specific diseases, and he claims for those who give attention in their work to this kind of practice, a footing of perfect equality with those who seek to find the causes of disease, or who unravel mysteries only by meditation in the dead-house. In the chapter devoted to the treatment of fevers, we expected to find some personal views recorded, in view of the statement several times repeated previously, that the author deprecated certain methods of treatment adopted abroad for these affections, as applicable to similar maladies with us. These we have not discovered, and, whilst the chapter is in the main complete, it goes over well-trodden ground, and makes no evident addition to our actual knowledge of the subject considered.

The sections on malarial fevers afford evidence of much experience in

their management, and the extended remarks on treatment of the intermittent, remittent, and pernicious forms are quite valuable additions to our acquired information of this matter. In the majority of instances, treatment may be properly begun by the employment of a mercurial followed by a saline cathartic. The system is then ready for the efficient action of quinine. This remedy must be exhibited with the beginning of the period of intermission, and during this time from fifteen to thirty grains should be taken in divided doses. For an ordinary case of intermittent fever no further treatment is usually required. In the treatment of remittent fever the author also insists upon the great advantages derived from the use of some mild mercurial in the first stage, and states very emphatically that, in his opinion, no other remedy, even of the modern cholagogues, accomplishes so much in regulating the secretions of the digestive organs. In the treatment of pernicious malarial fever the author regards securing the antidotal effect of quinine as soon as possible "as the only safety."

Under the head of Causes of Typhoid Fever an interesting report of an epidemic which broke out in a young ladies' institute in Pittsfield, Mass., is inserted. The result of the investigations there carried on prove conclusively that this fever is often a direct consequence of the bad condition of cesspools, privies, and drains. Such facts, although well known, are not improperly narrated in detail, in view of their great importance from a sanitary point of view. In this epidemic it was distinctly noted, also, how rarely the contagium of typhoid is *directly* carried from a patient to a person in good health. When the contagium is transported from one individual to another, it is usually carried by the non-disinfected intestinal discharges of the sick. A plea for the "dry earth" system for the disposal of excreta, is urged in the following paraphrase of Scriptural language:—

"Though so long, and still so often overlooked, this principle in human hygienics and decency is at least as old as Moses, whose directions respecting a paddle for each weapon were well adapted to the condition of the wandering Israelites; and doubtless long before the time of that hygienic reformer this was understood and practised by the domestic felines, and with more than human wisdom and consistency has been continued by them ever since."

Quite a number of formulæ are introduced into the text under the head of Treatment of Typhoid Fever. Sometimes they are written in English, sometimes partly in English, partly in Latin; frequently the Latin is open to criticism, as the following examples prove: *Oleo Ricini* (p. 272); *Liq. Ammonia Acetatis* (p. 273); *Extracti opi. liquidi* (p. 274). In speaking of the use of alcohol in this disease, the author affirms "that in ordinary cases it should be dispensed with entirely" (p. 283). Its use, however, is indicated according to him when the pulse is very rapid and feeble, or slow; in low delirium and stupor; if the tongue be brown and dry, with general depression. Whenever given, it is best to administer it in the form of pure alcohol, as the precise quantity given can be more easily estimated and regulated.

The section on treatment of typhoid is given with ample details, and is very readable. We do not, however, discover anything very different in it from what we should expect to find in a classical article written by one of the foreign authorities whose names are frequently cited, and we are here, as in very many places throughout the work, at a loss to understand in what consist the great differences between ourselves and distinguished foreign observers, in the treatment of fevers and other internal

diseases. We are sorry to remark that the author willingly accords the name of typho-malarial fever to an affection which, as he says, "may with propriety be applied to the resultant phenomena," and should not be, therefore, regarded as a morbid entity.

We are glad to notice that he holds to the view of the constitutional nature of diphtheria, and does not believe too great reliance should be placed upon mere topical applications. There is one stimulant in this affection which we have learned to value so highly that we are desirous that he and others may bring it into more general use, and that is coffee. When the heart action has become feeble and irregular, when the pulse is no longer but a mere thread under the finger, and when alcoholic stimulants have been taken in vain in large and frequently repeated doses, we have seen strong, black coffee act almost magically in restoring relative strength and vitality.

For the prevention of local pitting from smallpox, slight importance is attached to any local application. Carbolyzed oil, used by means of a soft brush, is recommended in rather an uncertain manner. The method of vaccinating with humanized virus, as we have good reason to believe, is not so frequent in our country as the author states, and we do not wish this antiquated method, against which there are so many strong objections, again to become popular.

The author would, in our opinion, have done well in pointing out more at length some of the features of differential diagnosis of scarlet fever. In some epidemics, even when the disease is thoroughly well marked in other particulars, the desquamation is very slight, and will scarcely by itself lend much authority to the diagnosis. In our experience, albuminuria, as an intercurrent phenomenon or sequela of scarlet fever, is far less frequently encountered than it is the habit to affirm. When it does occur, however, during the march of the disease, it is probably an effect of the scarlatina poison rather than the direct consequence of cold or exposure. Of course this view should not contra-indicate minute care in protecting children from rapid changes of temperature, but it makes our feeling of responsibility less when an unfortunate renal complaint declares itself in spite of the closest attention on the part of physician and nurse to ward it off. The author does not direct sufficient attention to the liability of purulent otitis during or consequent upon scarlatina. We are always watchful of the ears of our little patients, as we know how insidiously the middle ear may become inflamed and the membrana tympani ruptured. Loss or great impairment of hearing is no consequence of this condition, and we therefore should never be satisfied unless we are constantly on the lookout to detect the beginning of the aural inflammation, so as to treat it according to the most approved modern methods.

Throughout this work the sections on diagnosis are disposed of too rapidly and with very meagre details. This is a mistake in a book designed for students, inasmuch as many of the diseases they will encounter, and when they do they should have a work to which they can refer with a reasonable trust that their difficulties will be solved, and their powers of discernment greatly aided.

Hodgkin's disease, pernicious anæmia, simple anæmia, and chlorosis are described in five pages—rather a small reservation for very important subjects. A dietary ample and rational for diabetic patients, taken from Flint, is given in extenso. The dietary of those afflicted with gout is not considered of very great importance, as only a few lines are assigned its

study. Nothing is said about the bad effects of farinaceous substances eaten immoderately, nor again of the advantageous substitution for them of an alimentary largely composed of meat. Whilst the salicylates are alluded to, their use is not familiar to the author by personal experience. Throat diseases are not described in accordance with the latest views. Certainly very few laryngologists at the present time make applications of a concentrated solution of nitrate of silver to chronic pharyngitis, or prescribe hop and vinegar inhalations with a blanket thrown over the head to abort an incipient tonsillitis. Affections of the œsophagus, though not fully reported, are yet sufficiently well given to entitle them to more praise than can usually be bestowed upon the text of these diseases in most works of practice of medicine.

Diseases of the stomach is one of the best sections of this work, and were it not that the morbid anatomy is very deficient in quantity, might justly be praised for clearness and completeness. In the treatment of indigestion the author would not have his patients go to foreign watering-places in search of relief, as he believes that "all that is not quackery and deception at these places can be followed by every judicious physician according to his views of what is best under given conditions. Our perusal of the chapter on specific dysentery has been eminently satisfactory. The disease is a formidable one, is frequently met with in the summer practice of almost every physician, and is, therefore, one about which any further knowledge is always of interest, especially if it relates to curative treatment. Acute peritonitis is well described, with the exception of its pathological anatomy, which decidedly falls short of what it should be.

The affections of the intestines, including constipation and diarrhœa, are written with tolerable completeness, and are really ample in details in what refers to treatment. The different diseases of the liver, functional and organic, terminate the volume. Murchison, Rutherford, Frerichs, are put under frequent contributions, and the resultant product is correct and tolerably satisfactory.

Dr. Palmer is eminently a therapist. He believes in the use of remedies, and gets from their employment more good results than most practitioners are able to do. He falls short in his descriptions of morbid anatomy, simply because he himself is not a pathologist of the practical sort, and is therefore compelled to borrow largely from others in this department of his work.

After a careful perusal of this first volume of Prof. Palmer's large work on Practice, we are rather disappointed. If a new edition should appear, it would be much improved by making the sections on diagnosis generally fuller. The phraseology is at times far from correct as regards construction and the use of words. To this perhaps venial fault is added one which is more distasteful, namely, the use of many expressions which are in the highest degree commonplace and unsuitable to the character of the work. The paper, press, and general appearance of the volume are creditable. The work itself will prove useful to the practitioner who wishes to know what Dr. Palmer thinks of the treatment of a given disease, but he will not be likely to leave his foreign works to consult it in regard to other subjects embraced in the practice of medicine.

B. R.

ART. XVIII.—*Saint Bartholomew's Hospital Reports*. Edited by W. S. CHURCH, M.D., and JOHN LANGTON, F.R.C.S. Vol. XVII. 8vo. pp. xxvii., 347, 80. London: Smith, Elder & Co., 1881.

THE surgical papers of this volume are but seven, and of these only three seem to have been written by members of the surgical staff of the hospital. The others have apparently been contributed by gentlemen who have been at some period connected with the hospital as dressers or house-surgeons. The fact is mentioned to show the evident lack of interest felt in the reports by those who could furnish the best literary and surgical work. None of the papers are first-class surgical productions except the two written by Mr. Thomas Smith and Dr. Philip J. Hensley respectively. The article by Mr. W. E. Steavenson shows a good deal of literary research, and stands next in order of merit. The four remaining contributions have worth, but are either of interest only to those directly connected with St. Bartholomew's Hospital, or are collections of such isolated cases and facts that generalization is impossible. The papers are accordingly of little value to the general profession.

The list of articles on surgical and anatomical topics is as follows: Anatomical Variations, by W. J. Walsham; Cases of Empyema treated by Irrigation, with Remarks on the Operation of Paracentesis Thoracis, by Philip J. Hensley; a Case of Acute Traumatic Tetanus, by F. Swinford Edwards; Our Museum and its Associations, by Frederic S. Eve; Surgical Cases, by John Langton; Paracentesis Pericardii, by W. E. Steavenson; Supra-pubic Puncture of the Bladder, by Thomas Smith.

The paper on *Empyema* is illustrated by a cut showing the author's method of irrigating the pleural cavity with antiseptic solutions, which he does by using a reservoir, and inserting into the chest two canulas. The precautions taken to preclude the entrance of air and to avoid plugging of tubes with shreds of lymph are ingenious and evidently efficient. He does not like Potain's aspirator with the vacuum bottle for ordinary tapping, because among other reasons there is no ready means of judging of the pressure. He prefers to draw off the fluid by the siphon principle, keeping the lower end of the tube beneath the surface of some antiseptic solution placed on the floor. After the serum has started to flow into the bottle of the aspirator, the present writer usually employs the siphon method, by opening the discharge tube, and keeping the end below the patient. The flow into the bottle from the chest and the outflow from the bottle then keep up a steady stream in the same ratio, and no air can enter the chest because the bottle is continuously kept about half full of fluid. The pump is used to increase the suction if thought necessary. This method is perhaps not as perfect as that described by the author.

The case of *Tetanus* was due to a superficial injury of the heel, and was cured by excision of one and a quarter inches of the external saphenous nerve, chloral administered internally, and the application of ice-bags to the spine.

The historical account of the *Museum* does not greatly interest the outside world, except by its allusions to early pathological views.

Mr. Langton's *Surgical Cases* are a medley of rather interesting cases of aural disease, hæmatoma of the epididymis, nerve-stretching, and nerve suture.

The essay on *Paracentesis Pericardii*, which reports a recent case, makes the following assertions :—

“The greatest difficulty exists from the physical signs to be sure that there is pericardial effusion, unless the dulness caused by the effusion extends to a very high level. An increased area of cardiac dulness at the lower part of the thorax cannot be distinguished from that caused by an enormously hypertrophied heart, and therefore paracentesis is hardly justifiable unless the patient is *in extremis*. It is even then a somewhat startling incident to introduce a trocar and for the patient to fall back dead.”

In the opinion of some writers there *are* methods of physical diagnosis which nearly always enable the attendant to distinguish between pericardial effusion and cardiac hypertrophy. A delay in performing paracentesis until the patient is *in extremis* is certainly unjustifiable, because then it is usually too late to cure him by withdrawing the fluid.

Mr. Thomas Smith's discussion of *Supra-pubic Puncture of the Bladder* is practical, convincing, and suggestive, and is, moreover, illustrated by cases *well* reported. He prefers the supra-pubic to the rectal puncture in urethral obstruction due to prostatic enlargement or impassable stricture, because easier of performance, and especially because the patient soon learns to attend to himself, and can draw off the water at will by keeping a canula in the wound.

The tables in the appendix of the volume give an analysis of the cases treated, and an account of the anæsthetics employed. One case of death occurring during etherization is recorded, but the details are not very completely given.

J. B. R.

Proceeding now to a consideration of the medical articles, we find the opening paper of the volume is a brief contribution from Dr. J. MATTHEWS DUNCAN, entitled *Notes on the Morbid Anatomy of Douglass's Pouch*, in which are detailed, first, two cases of malformation, the latter a curious instance of absence of the vagina and uterus in an apparently well-developed married woman. This is followed by an account of certain common, and other unusual changes, in the site and position of the pouch in question, which are all of much interest from a gynecological point of view.

Dr. SAMUEL GEE, who contributes the next essay, *On Osteal or Periosteal Cachexia*, very properly apologizes for the imperfect condition of his notes, which are, indeed, so fragmentary that we are inclined to think that a judicious regard for his own reputation would have induced the author to withhold them from publication. They comprise the skeleton histories of five infants, three of whom Dr. Gee admits were “rickety,” and in none are we favoured with the gross post-mortem appearances, still less with the results of microscopic investigation.

The next article, *On Tufnell's Treatment of Aortic Aneurism*, is a valuable paper by VINCENT HARRIS, M.D., giving the results of this highly philosophical method in the wards of St. Bartholomew's Hospital. It might be carefully perused with profit by any physician taking charge of one of these serious cases.

The plan of Mr. Tufnell, according to the opinion of our author and several of his colleagues, leaves, however, much to be desired, for, although almost certain relief of symptoms is obtainable, cures are rather rare. Still, as remarked in a note by his friend, Dr. Andrew, a method which was a success in three cases out of the thirteen recorded, and was attended with little or no danger to the patient, is, at least, not inferior to any other in

present use. Dr. Andrew believes, moreover, that it will give better results in private, than in hospital practice.

J. A. ORMEROD, M.B., furnishes a well-written essay *On the Diagnostic Symptoms of Tabes Dorsalis with Cases*, which forms quite a valuable little contribution to our knowledge of this important neurosis. As a whole, his cases, twenty-one (?) in number, confirm the generally received idea, that the absence of the patellar tendon reflex, and the abnormal state of the pupil, are to be observed in almost every instance of tabes, even in those where other symptoms of the disease are but little developed. Mr. Ormerod's other conclusion, that, because in two years he has been able to record twenty-one cases, the disease is more common than is generally supposed, might lead some envious rival to assert that his diligence in search is more remarkable than his accuracy in detection.

Dr. W. H. CHURCH supplies some valuable *Observations on Typhoid Fever*, which contain the practical results of a careful and acute observer's experience with 113 cases of this disease, treated in the hospital during the past five years. The paper is full of useful facts well worthy of the attention of every practical physician, and we would be glad to give a much fuller abstract did space permit. Of the total number 61 patients were males, of whom 12 died, and 52 were females, among whom were 5 deaths.

Dr. Church finds himself more and more convinced that typhoid fever runs not infrequently (especially in children) an abortive course, and records two of these cases as terminating on the fourteenth day and one on the eighteenth day. He does not, however, confirm the statement of Prof. Jürgensen, that these examples of typhoid of the short type (*typhus levis-simus*) are especially apt to display a sudden and severe onset.

Our author disputes the opinion of his colleague, Dr. Gee, that when the pyrexial state lasts beyond the twenty-sixth day (cases with accidental complications excepted) it is due to "progressive ulcerative enteric or sub-intrant relapse." In two of his non-relapsing cases, fatal on the twenty-third day, the majority of the ulcers in the ileum had the sloughs still attached, and might apparently have gone on several days longer before commencing to heal.

In one instance sudamina formed a remarkable feature, coming out in crops in great abundance; in another the rash was very profuse, covering the body and legs with thousands of rose-coloured spots, which seemed to fade into purpurous patches. Curious trance phenomena appeared in this female, and unusually prolonged stupor in a boy aged nine years, but all these anomalous attacks ultimately resulted in good recoveries. Constipation occurred in a large proportion of cases in the past two years, and singularly enough we have observed this peculiarity here in Philadelphia, with much greater frequency than formerly, but, of course, a much longer time is requisite to establish such a variation into anything more than a coincidence. Tympanites and hemorrhage proved themselves, as usual, grave symptoms, and the rare complication of abscesses in the larynx with necrosis of the arytenoid cartilages, ending fatally, occurred once.

The treatment was mainly expectant, though a majority of the patients took a draught containing hydrochloric acid, in the hope that digestion would thereby be assisted. Quinine, as an antipyretic, did not answer Dr. Church's expectations, and salicylate of soda, when given in large enough doses to lower the temperature, produced sometimes such alarming depression that its use was abandoned. Opium enemata were used to control diarrhœa, small doses of liquid extract of opium by the mouth to relieve

abdominal pain, and chloral or chloral and bromide to procure sleep. Cold bathing was not used in mild attacks, but was employed, as a rule, whenever the temperature remained for twenty-four hours or so, above 104° F.

A study of the table of the 19 fatal cases further aids to strengthen the doctrine we have long taught, that the sadly neglected science of prognosis can be rendered far more accurate, and therefore more useful, by a systematic interrogation of *all* the organs at the outset, and daily throughout the disease. Thus, of the 19 patients 11 died from complications developed during the fever, and dependent on it, and two others succumbed to the accumulated pressure of typhoid fever plus long-standing cardiac or renal disease.

The death-rate from typhoid has fluctuated in St. Bartholomew's Hospital, from 5.88 per cent. in 1860, to 31.11 per cent. in 1869, the whole mortality for twenty years being at the rate of 15.72 per cent.

In *An Historical Case of Typhoid Fever*, Dr. NORMAN MOORE makes a singularly ingenious attempt to show that the death of Henry, Prince of Wales, which took place in London November 6, 1612, was the result of typhoid. Without actually proving his thesis is logically correct, Dr. Moore undoubtedly establishes a great probability that, as he claims, it is due to the accurate observation of Sir Theodore Mayerne, the chief physician in attendance, that his name should be remembered as the exact describer of the earliest case of typhoid fever on record in England. We would suggest to enthusiastic antiquarians in the ranks of sanitary science, that the next thing in order would be to demonstrate from some contemporary records (as it really may be possible to do), out of which foul sewer or neglected cesspool in the king's palace arose the germs of typhoid fever, which multiplied in the body and caused the death of this illustrious prince.

J. A. ORMEROD, M.D., contributes a carefully written series of *Notes on Tendon Reflex in the Later Stages of Hemiplegia*, giving the result of his observations in the out-patient room and in the casualty department.

The general result of his investigation, without being very conclusive, tends to confirm Charcot's doctrine that "late rigidity" (which our author found to come on generally after excess of tendon reflex had been present) is apt to be due to functional excitement of the motor cells of the cord produced by sclerosis of the lateral columns.

An interesting paper *On Some Forms of Dilatation of the Heart with Illustrative Cases*, furnished by SAMUEL WEST, M.B., is well worthy of careful perusal. Our author includes observations upon thirty cases of chlorosis and numerous examples of rheumatism, febrile diseases, etc. He classifies the causes of dilatation in four principal groups, as follows: 1st, defective blood supply; 2d, defective muscular tissue (of the heart); 3d, defective nerve regulation; and 4th, overwork.

Cancer of the Pancreas is the title of an illustrated article by NORMAN MOORE, M.D., founded upon ten post-mortem examinations of the pancreas when affected with a new growth. These were all made in the past three years, and in four instances the pancreas was almost the only organ thus involved. Three of these neoplasms were carcinomata, and a fourth was an adeno-sarcoma, a form of pancreatic disease which Dr. Moore thinks has not been described before, "certainly not in England." The author appends a table of 39 cases of cancer of the pancreas described from 1867 to 1881 in the records of autopsies at St. Bartholomew's, and his clinical conclusions from these are, that long persistent jaundice, in

which gall-stone symptoms are absent, and in which cancer of the liver is not to be felt, may probably be due to primary cancer of the pancreas; and that this diagnosis is confirmed when an enlargement followed by a diminution in size of the liver indicates during life the cirrhosis frequently found after death. Dr. Moore also reports *A Case of Stenosis of the Tricuspid Valve*, which tends to confirm the view maintained by some writers that such valvular contraction is always congenital.

Two Cases of Subacute Anterior Spinal Paralysis are recorded by CHARLES A. MORTON, in only one of which a post mortem was obtained. In this instance degeneration of the ganglion cells of the anterior cornua was discovered, but the nature of this change must have been very obscure, as even Dr. Klein, who saw the specimens, could not determine its character.

Dr. T. CLAY SHAW, in a thoughtful essay on *Acute and Chronic Insanity*, argues against the too prevalent error of considering a person who has been insane twelve months a chronic and incurable lunatic, who is to be, as it were, put on the shelf and counted as practically dead for all that treatment can do for him. Dr. Shaw declares that he has seen persons who have been ill fifteen years or longer, and who are still in the acute stage of brain disease, and asserts that such individuals "might at any day put an end to the idea that because they had been so long harmless they will always be so, by putting an end to themselves."

An instructive paper on *Lead Impregnation in Relation to Gout*, is contributed by Dr. DYCE DUCKWORTH. It embodies his experience of the influence exercised by lead in cases of gout. As a general result of his observation it may be stated that while he believes that the association of gout with lead impregnation is most distinctly manifested when gout most commonly prevails among the population, he cannot agree with Professor Frerichs or Dr. Saundby, of Birmingham, the latter of whom contends that the doctrine of saturnine gout rests rather on authority than observation.

J. ARMITAGE, M.B., furnishes some interesting *Cases from Dr. Gee's Wards*, comprising two instances of non-fatal sunstroke—one with the high temperature of 108.9° F.; and a case of acute yellow atrophy of the liver proving fatal in nine days from the time the patient stated he was in perfect health.

PERCY KIDD, M.D., gives an account of a case of *Pseudo-Hypertrophic Muscular Paralysis in an Adult*, the chief interest of which centres in the patient's age and in the fact that no decided failure of muscular power showed itself until after he was twenty-one years old. Microscopic examination of the affected muscles was unfortunately omitted.

DAVID A. KING records a case of *Membranous Pharyngitis* (diphtheria) *following Scarlatinal Infection*, and argues from this one instance in the *post hoc ergo proper hoc* style, which captivates so many of the junior members in our profession. *Two Cases of Intestinal Obstruction*, also carefully reported by the same author, are used to show the advantage of expectant treatment over operative interference in such accidents.

Dr. SAMUEL GEE follows with a report of *Two Cases of Cerebral Disease*; one of hemichorea found on post-mortem examination to be probably dependent on embolism, with thrombosis of the cerebral capillaries; and the other a second case of gelatiniform enlargement of the pons Varolii, the first, and only other on record as far as Dr. Gee is aware, being narrated many years since in the thirteenth volume of these reports.

Apparently on the good old principle of leaving the best until the last, the editors of the volume have reserved for a concluding paper the learned and able *Report on Hæmophilia*, with a note on the hereditary descent of colour-blindness, by Dr. J. WICKHAM LEGG. This valuable essay is illustrated by a genealogical tree of a "Bleeder" family for five generations, and a similar tree of a colour-blind family for six generations. These representatives of the original tree of knowledge exhibit several curious phenomena observable in the transmission of inherited disease to remote posterity, and suggest how unspeakably useful to every family would be similar genealogical tables showing when and where consumption, gout, apoplexy, and all the other "ills our flesh is heir to," had assailed their ancestors. We heartily welcome such publications, since they can scarcely fail to promote a more general realization of the great truth which we have long laboured to promulgate—that each individual's diseases mark points in the infinitely small arc of an immensely great family curve, which may be ascending through generations to a "survival of the fittest," or descending through centuries to an *extinction of the unfit*. Most earnestly is this to be urged, because when popularly recognized it must lead to the compilation with religious truthfulness and care of such complete family records respecting diseases, that physicians of the future, acquiring therefrom a far more perfect knowledge of heredity, will be infinite gainers in accuracy of prognosis, success in treatment, and, best of all, in the power of preventing disease.

J. G. R.

ART. XIX.—*Transactions of the International Medical Congress. Seventh Session held in London, Aug. 2 to Aug. 9, 1881.* In four volumes: Vol. I. pp. 519; Vol. II. pp. 599; Vol. III. pp. 660; Vol. IV. pp. 592. London: J. W. Kolkman, 1881.

It may be confidently stated that no session of the International Medical Congress has been more successful than the seventh held in London. Whether this Congress is regarded from the point of view of the numbers in attendance, the eminence of the men who participated in the sessions, or the excellence of the papers, either the general addresses or the pieces submitted to the Sections, it must be considered as the most important of the series. It could hardly be otherwise. In this session of the Congress, the English-speaking members of the medical profession, had a prominent part, and they have always made the most substantial advances in medical knowledge. Admitting without question the learning, the science, and the painstaking work of our German colleagues, the brilliant powers of exposition, the logical acumen, and the original conceptions of the French, it must still be conceded, that to the great English physicians are due most of the important practical advances made in medicine during the century. It was but natural to expect much from an assemblage of the world's great medical men in the world's great capital—London. The highest expectations are fully satisfied on a perusal of the four portly volumes recording the work of the Congress.

The first volume is occupied with the list of delegates and members; the proceedings of the general meetings; the inaugural address of Sir James Paget; the general addresses by Virchow, Reynaud (read by Fe-

réal), Billings, Volkmann, Pasteur, and Huxley; report on the Congress Museum, and the proceedings of the Sections of Anatomy, of Physiology, of Pathology, and of *Materia Medica* and Pharmacology.

The Congress was under the patronage of the Queen and of the Prince of Wales. "The first general meeting was honoured by the presence of His Royal Highness the Prince of Wales, His Imperial and Royal Highness the Crown Prince of Germany and Prussia, and a few visitors of distinction, among whom were the Archbishop of York, the Cardinal Archbishop of Westminster, and the Bishop of London."

The Prince of Wales has been a friend of doctors. Passing safely through an attack of typhoid fever, under the charge of Jenner and Gull, a few years ago, he has learned the value of skilled medical advice. It is greatly to his credit that he has not forgotten the men to whom he is largely indebted for his life. He not only appeared at the opening of the Congress, but induced his illustrious brother-in-law—*unser Fritz*—also a scholar and a man of science, to add to the splendors of the occasion by appearing on the platform. The Prince of Wales as "Patron," made a brief address, when Sir James Paget had taken the chair as President. The inaugural address by Paget made a profound impression on that vast assemblage. It was delivered *ex tempore*, and was a masterly summing up of the methods and purposes of the International Congress. Sir James Paget is said to be one of the finest orators in England. On this occasion he fully sustained his high reputation, and spoke in a manner to excite the admiration of all who heard him.

The first of the general addresses was delivered by Virchow in German, and was, as might be expected, a most able discourse, and triumphantly vindicated the modern methods of scientific research. As Sir James Paget said in his usual felicitous manner, this "address is, I am sure, one for which, however heartily we may thank him now, we shall often and as heartily thank him in the future; for we shall have it for reading and deliberate study; and the more we study it, the more it will prove itself to be an admirable instance of the rare combination of abundant pathological and historic knowledge, with the power of strong argument and clear statement for which Professor Virchow has always been renowned."

Social entertainments were elegantly interspersed with the purely intellectual exercises of the Congress. On the afternoon of the day celebrated by the delivery of Virchow's address, we learn that "the Prince of Wales and the Crown Prince of Germany and Prussia honoured the President with their company at luncheon, and a select party was invited to meet their Royal Highnesses. In the evening, on the invitation of Sir Wm. Gull, their Royal Highnesses dined at Willis's Rooms with a party of the members of the Congress."

The next general address was that of Dr. Maurice Reynaud *On Skepticism in Medicine Past and Present*. A melancholy interest attaches to this paper in that the accomplished author died just on the eve of the meeting. His friend Dr. Feréol, however, with great delicacy and good judgment performed the duty of reading the address which Dr. Reynaud had prepared. This paper is marked by all the characteristics of the best French medical work, and is an attempt to show the influence of an enlightened skepticism over the progress of medical science.

The evening following this address was utilized by a banquet given by the Lord Mayor of London in the Egyptian Hall. To the toast of our

foreign visitors, response was made by Laugenbeck, Trélat, Pantaleoni, and Austin Flint.

The best received of all the general addresses, was that by Dr. Billings, of our army, on *Our Medical Literature*. As regards manner of delivery, and matter, it proved to be more grateful to the literary sense of the audience, than those orations which possessed more scientific merit. The great English medical weeklies at the time bestowed warm praise on Dr. Billings's effort, and it was also the theme of much private commendation. Sir James Paget, the President, at the conclusion of the address, gave expression to the unanimous feelings of satisfaction, in saying, "I am sure I should express the feeling of you all, if I were to say that if this single paper were the sole production of the Congress, it was worth coming here to meet that it might be produced." High praise, truly, but not undeserved.

At the fifth general meeting there were two general addresses, and very notable ones they were: the first, by Prof. Volkmann, of Halle, *On the Progress of Modern Surgery*; and the other by Pasteur, *On Vaccination in Relation to Chicken-Cholera and Splenic Fever*. The latter detailed the methods by which these poisons could be so reduced in activity as to be safely inoculable—discoveries then new to the profession, but now known to the whole world. We need not, therefore, discuss the remarkable facts made known by the great Pasteur. The last of the general addresses was delivered by Huxley, *On the Connection of the Biological Sciences with Medicine*. This discourse is in the usual felicitous manner of this accomplished philosopher. It is largely occupied with the historical development of biology and medicine. His final judgment is expressed in the following paragraph:—

"The search for the explanation of diseased states in modified cell life; the discovery of the important part played by parasitic organisms in the etiology of disease; the elucidation of the action of medicaments by the methods and the data of experimental physiology; appear to me to be the greatest steps which have ever been made towards the establishment of medicine on a scientific basis."

The last general meeting, which concluded the business of the Congress, was characterized by a series of congratulatory resolutions, and by the presentation of medals of honour to Prof. Donders, President, and Dr. Guye, Secretary-General of the last Congress, and to the authors of the general addresses of the present Congress, referred to above. The proceedings closed in a blaze of enthusiasm. The immense numbers in attendance, the illustrious personages who flashed on the scenes, the great scientific names present and participating, the excellence of the work done, and the unbounded hospitality and the brilliancy of the social entertainments, combined to make the London meeting an unclouded success.

Our British cousins, once for all, did away with their notoriety for social exclusiveness and insular prejudices. They demonstrated, what all who have seen anything of English physicians know to be genuine features of their character—a hearty hospitality, warmth of feeling, and sincere respect for character and ability. If somewhat reserved, when they admit one to friendship who deserves it, they become genuinely cordial. If they wish to be assured of the character of those who seek their friendship, they do not yield their faith, when once given, for idle reasons. As English physicians have always occupied the first place in respect to substan-

tial improvements in medical knowledge, so, also, have they been foremost in maintaining the social position of the profession, their personal dignity, and their reputation for literary and scientific culture.

Before quitting the consideration of these topics, we should have something to say of the work of those who did most to make the meeting a success. Sir Wm. McCormac, the Hon. Secretary-General, must be first mentioned; to him, more than to any one else, should the credit be given. The Executive Committee, of which Sir James Risdon Bennet was Chairman, and the Reception Committee, of which Mr. Prescott Hewett was Chairman, worked with great zeal, the former, for two years or more, in preparing the vast details incident to the assemblage of so many delegates and guests, and the latter, in arranging for the reception and disposition of the members of the Congress. During the meeting the time of Sir James Paget and the other officers was wholly given up to the affairs of the Congress, and to the onerous social duties devolving on them. From the many in attendance we have heard but one opinion expressed, that the arrangements of all kinds were marvellously successful, and that in praise of those in charge too much cannot be said. When we reflect that all modern civilized nations were represented, and the number in attendance 3182, we can but wonder that so much was accomplished without jarring on the susceptibilities of any. Next to England and her colonies, the largest number of delegates and guests came from the United States, 220 in number.

As is the custom of the International Medical Congress, the officers were taken from the nation at whose capital the meeting was held. Hence, the President of the Congress, and the Honorary General Secretary, and the Presidents and Secretaries of the Sections, were English physicians. The International Congress of the Centennial year, held at Philadelphia, was an independent body, and not of the series of the European organization. At the London meeting, the profession of the United States was duly represented, and well and adequately recognized. As has already been stated, one of the general addresses was delivered by Dr. Billings, and papers in the Sections were read by Drs. Austin Flint, S. W. Gross, Sayre, Otis, Jacobi, Knapp, Jeffries, Lefferts, Cohen, Battey, Mundé, Gihon, Billings, and others, about thirty-five in all, besides the discussions participated in by many of those not reading original papers. We have no hesitation in saying that the contributions of the American delegates were, in general, not inferior to those of other nationalities.

Besides the general addresses above referred to, Volume I. contains the proceedings of the Sections of Anatomy, Physiology, Pathology, and Pharmacology. Referring only to those with which it is our province to deal, we begin with the Physiological Section, presided over by Dr. Michael Foster, of Cambridge. He chose for his inaugural address the part which English physiologists have taken in the construction of the modern science of physiology. Beginning with Harvey, he conducts us through the remarkable series containing amongst lesser names those of Willis, Hales, Hunter, Bell, Marshall Hall, all men whose work laid the foundation of modern physiology, and which no other nation can really equal. Foster concluded his address with a sorrowful reference to that absurd antivivisection legislation, which has not only hampered, but has almost stopped physiological research in England.

The proceedings of the Physiological Section were enlivened by a scientific tilt between Prof. Goltz, of Strassburg, and Ferrier, of London, in

regard to cerebral localization. Goltz, having destroyed, as he supposed, certain areas of the cortex of a dog, produced results not in harmony with those obtained by Ferrier from the monkey. Now, as Ferrier maintained, a homology in the cerebral structure being admitted to exist, there should be a certain correspondence in the results in the two animals. It became necessary, therefore, to settle the question thus raised, and to determine the areas of the cerebral cortex of the two animals that had been destroyed. A committee was entrusted with this duty; the animals, Goltz's dog and Ferrier's monkey, were carefully examined, their damages ascertained, and they were then killed to fix the exact position of the supposed lesions. The result was that Goltz was found to have erred in the position and extent of the lesion which he supposed had been inflicted; whereas, Ferrier's claim was exactly verified. In this encounter, the Englishman had the better of his German antagonist most clearly. With a fine sense of poetical justice, Dr. Ferrier was arraigned by the Society for the Prevention of Cruelty to Animals, and made to answer before the police court for a violation of the vivisection act, in operating on animals without a license. Fortunately, the monkeys were proved to be the property of Dr. Yeo, who had a license, and Dr. Ferrier was acquitted.

Dr. François Franck, of Paris, gave an able address on *The Nervous Mechanism by which the Heart-beat is regulated and maintained*. He concludes, if we understand him aright, that the action has not been ascribed to the heart-muscle, which has the sufficient power of rhythmical contraction to which the nervous influence is secondary. "The influence of the cardiac ganglia is not indispensable to the production of the rhythmical movements of this organ," is his statement; and, again, that "the rhythmic function appears to be a property of the muscular fibre of the heart."

Dr. Gaskell, of Cambridge, in following Dr. Franck on the same subject, proposed a new theory of the action of the vagus nerve on the heart, based on a new method of studying the cardiac movements in cold-blooded animals. He concludes that the vagus acts directly on the muscular tissue of the heart, and not as a motor; but as a trophic nerve.

Dr. H. C. Wood, of Philadelphia, addressed the Physiological Section on animal heat. He began by defending the use of the calorimeter, which he regarded capable of "reliable results" when rightly used. He had nothing to say, however, of the manifest defects of the instruments now employed in such researches. He holds that the nervous system presides over both the production and dissipation of heat. His final conclusion is that "fever is simply the result of a depressing poison acting upon the nerve centres presiding over heat production and dissipation."

Prof. Rutherford, of Edinburgh, discussed *The Microscopical Appearances of Muscular Tissue during rest and contraction*, and Dr. Klein *Some Points on the Structure of Cells and Nuclei*. One of the most important papers presented to the Physiological Section, was that of Prof. Donder's entitled *New Researches on Optical Systems*. It is, however, too technical and mathematical to be of general interest.

The Section on General Pathology and Morbid Anatomy was presided over by Dr. Samuel Wilks, F.R.S. There were several papers on tubercle, and an interesting discussion in which Virchow participated. The most important contributions were on the subject of minute organisms, the first one by Prof. Lister relating to the influence of micro-organisms on the condition of wounds, and on the inflammatory process, and one by

Prof. Klebs on the question of the action of germs in the production of specific diseases. This subject was also discussed in separate papers by Prof. Fokker, Bouchard, Béchamp, and Dr. Geo. Harley. In the course of the discussion on tubercle, Virchow made a prophetic declaration in regard to the effect the discovery of a minute organism would have in simplifying the theories of the origin of tubercle. The space occupied by these papers, and the interest of the discussions, show how important to modern pathology has become the question of micro-organisms.

The morbid anatomy of Bright's disease was discussed in papers by Sir Wm. Gull and Dr. Sutton, by Lancereaux, by Johnson, by Grainger Stewart, and by Saundby. The relation between the kidney and the vascular changes was especially the subject of inquiry. Our readers will probably recall the sharp, almost acrimonious, discussion between Gull and Sutton, on the one hand regarding their theory of an arterio-capillary fibrosis, and Dr. George Johnson on the other, regarding his doctrine of hypertrophy of the muscular layer of the vessels. Both parties have forgotten something and learned much. The mutual concessions which have since been made, and the new studies of the German and French pathologists, leave the question of the changes in the vessels occurring in chronic Bright's disease in about the following shape:—

First, it is now universally conceded that the walls of the vessels in this disease are hypertrophied. Second, the hypertrophy consists in part in an increase of the muscular elements as claimed by Dr. Geo. Johnson. Third, the connective-tissue elements, also, undergo a hyperplasia of an inflammatory kind, somewhat as claimed by Gull and Sutton. So here, as is usual in such disputes, the truth lies not exclusively with either, but is embraced to some extent in the theories of both parties.

Dr. Dreschfeld and Mr. Stocks, of Manchester, England, described a case of hæmoglobinuria, produced by large doses of chlorate of potassa—one and a half ounces, in twenty-four hours. The history of such a case is very important. Soon after taking the remedy the woman became suddenly ill, had dyspnœa, was cyanosed, afterwards slightly jaundiced, and vomited and passed by stool masses of hæmoglobin. The urine also contained hæmoglobin. She died on the fourth day. The blood was fluid, dark brown, and contained an excess of leucocytes; the spleen was swollen and soft; the convoluted and straight tubes of the kidneys were filled with pigment granules, and with disks, the size of blood corpuscles; and the glomeruli were perfectly intact. All other organs appeared to be healthy. Dr. Stephen Mackenzie reported some other cases in which hæmoglobinuria was produced by chlorate of potash. He also called attention to a series of cases of diphtheria treated by Dr. Kuser with the chlorate, in which the heavy mortality seemed to be explained by the administration of this remedy. Our readers must be familiar with the warning given by Dr. Jacobi, regarding the use of chlorate in diphtheria. The vast array of facts now in our possession respecting the toxic activity of the potash salts, should render us circumspect in their use.

Besides the foregoing, we find some excellent papers, on points in the histology of the spinal cord, by Dr. Kesteven, of London; on the pathological anatomy of primary lateral sclerosis, by Dr. Dreschfeld, of Manchester; on calcification of epithelioma affecting the sebaceous glands, by Dr. Malherbe, of Nantes; on aneurism of the cerebral arteries, and on the extension of lympho-sarcoma, by Dr. Joseph Coats; on fibroid degeneration of the heart, by Dr. Turner, etc. It must be granted, we think, that

the Section on Pathology, did much valuable work. They discussed some of the most important questions of the day, and if they prepared the way for the final settlement of few, if any, they threw more or less light on all. Hardly any serious topic in pathology was passed over without some notice.

The last portion of Vol. I. is occupied with the proceedings of the Section of *Materia Medica* and Pharmacology. The space thus filled is from page 441 to 519 inclusive. The Section was presided over by Prof. Thos. R. Fraser, of the University of Edinburgh. In his very able inaugural discourse, Prof. Fraser first defined the work of the Section; then showed that the experimental method is the true mode of advancing knowledge in this department, illustrating this point by some very striking examples; and finally alluded with some asperity to the hindrances to the experimental method, to which they were subjected in England by the vivisection law.

The first paper was by Dr. William Squire, of London, on ethyl-bromide, or bromic ether. After an account of its chemical and physical properties, Dr. Squire showed that it might be used as a local anæsthetic, as a general anæsthetic, and when moderately inhaled, as a means of lessening nervous and vaso-motor disturbance. As a local anæsthetic, Terrillon proved that it was superior to all other agents. It evaporates readily, and destroys sensibility before freezing of the part is effected. It affords relief to deep-seated pain when applied as spray. Dr. Squire refers to the unfortunate history of ethyl-bromide as an anæsthetic, as it occurred in this country, and it is not as a general anæsthetic that he proposes its use now. As Prof. G. Sée used iodide of ethyl in asthma, and in other cases where the iodides were indicated, so, Dr. Squire proposes the inhalation of bromide of ethyl, in diseases where the bromides are beneficial. He finds that unconsciousness need not be induced. He drops on a square-inch piece of lint twenty to thirty drops of ethyl-bromide, and this placed on a handkerchief is held over the mouth during three or four inspirations. He finds such inhalation of decided benefit in certain neuroses, vaso-motor especially, in renal dyspnoea, laryngeal spasm, some kinds of vertigo, etc. As this agent relaxes vascular tension, it is useful when a condition of vaso-motor spasm is present.

Dr. Fothergill presented a paper intended to emphasize the fact that strychnia is a stimulant of the respiratory centre, and an agent of great value in respiratory depression. Drs. Brunton and Smith supported the statements of Dr. Fothergill. Papers on antipyretics, by Prof. Binz, Prof. Fokker, Dr. Donath, and Prof. Ceci followed. The drift of the observations was that a certain relation exists between the antiferment power and the antipyretic action; that agents having the power to destroy the germs or minute organisms of disease, or morbid ferments, arrest the fever process produced by the multiplication of those organisms or ferments in the blood. In the discussion which followed, Prof. Wood brought forward his calorimeter again, and insisted upon the distinction in the action of an antipyretic whether it prevent heat production or facilitate heat dissipation. This seems like a vague crying out in the wilderness, for do not those remedies which increase the capillary circulation and thus favour radiation of heat, rather raise than depress temperature? Papers by Dr. Dujardin-Beaumetz on pelleterine, etc.; by Prof. H. C. Wood, on the nature and limits of physiological antagonism; by Dr. Squire, on pilocarpine; by Dr. Hay, on the action of saline cathartics; by Prof. Boehm,

on the action of remedies affecting the heart and the blood pressure (in German); by Dr. Gaskell, on the effects of atropia and muscaria on the heart; by Dr. Gibson, on the physiological action of duboisia; by Prof. Rossbach on papayotine, and, finally, by Dr. Roberts on peptonized food. These are interesting and valuable papers, but they call for no special comment. Take them all in all, the proceedings of the Materia Medica Section, are of great value. They possess more distinctly practical qualities than most of the papers presented to the Congress, and will therefore be relished by the practitioner, who can at once utilize the observations offered him.

During the sessions of the Section, Prof. Stokvis, of Amsterdam, introduced the following resolution: "That in the opinion of this Section, the advancement of our knowledge concerning the action of medicines cannot be promoted without experimentation on the lower animals," which was carried with one dissenting voice.

Volume II. contains the proceedings of the Sections of Medicine, of Surgery, and of Military Surgery. We are concerned now with the Section of Medicine only. Sir Wm. Gull was President, and Drs. Dyce Duckworth and William Miller Ord were the Secretaries of this important Section.

The inaugural address, by Sir William Gull, was happily conceived and admirably expressed. After sketching briefly some of the great contributions to medical science made by men of the various nationalities represented at the Congress, he indicated some of the topics to be considered by the Section. He concluded in the words of Bacon: "It were a Heaven upon earth, to have the mind illumined by knowledge, to move in charity, and turn upon the poles of truth."

The topics discussed included Jacksonian epilepsy, syphilis as a cause of locomotor ataxia, nerve stretching, the tendon reflex, Addison's disease, gout and rheumatism, eczema and albuminuria in relation to gout, Bright's disease, auscultation and percussion, treatment of phthisis at high altitudes, influence of railroads on the nervous system of travellers, lead nephritis and arthritis, etc. The papers read on these subjects are of superior merit, and the discussions usually thorough and appropriate.

The first paper is by Dr. Hughlings Jackson, of London, on *Epileptiform Convulsions from Cerebral Disease*, and is an exposition of his peculiar views in respect to the mechanism of such seizures from lesions of the cerebral cortex. As his explanations have been largely accepted, and such epileptiform seizures are now entitled "Jacksonian epilepsy," it may be useful to place before our readers a very brief statement of Jackson's opinions. Those who have paid any attention to the progress of cerebral localization will remember that Ferrier originally undertook his course of experiment to ascertain the correctness of Jackson's theory regarding the existence of motor centres in the gray matter of the cerebral hemispheres—the *cerebral cortex*. It is known, of course, that Ferrier, as also Hitzig and Fritsche, and Nothnagel demonstrated numerous volitional centres in the cortex. If a motor centre exist in the gray matter, it follows that when the will acts, regular and orderly muscular movements must follow. It also follows according to Jackson that when irritation is applied to such a motor centre that irregular and disorderly movements will result—in other words, convulsions will occur.

The impression of the will starts an impulse which originates in the motor cells, and such impulse is the evidence of the normal or physiologi-

cal condition of these cells. Irritated by pathological new formations, an impulse is also originated, but it is of a kind inducing disorderly movements, or convulsions. Such lesions are said by Jackson to be "discharging;" that is, due to the discharge of nervous force accumulated under abnormal conditions, which to him is a highly "unstable" state of the cells. Having discharged all the energy stored up in these cells, they for the time being are unable to functionate—hence the paralysis, the aphasia, and other impaired functional states which sometimes follow epileptiform seizures. Dr. Jackson's communication was followed by a paper in German by Dr. Franz Müller, of Graz, in which he reports a case of circumscribed lesion supporting the theory of Dr. Jackson. This paper is illustrated by a drawing showing the area of the lesion of the cortex producing the convulsive phenomena.

Dr. Buzzard, in an interesting paper, *On Certain Little-recognized Symptoms of Tabes Dorsalis*, shows that persistent and severe gastric derangement, atrophy of the optic nerve, and sudden failure of muscular power in both limbs, may be symptoms merely of tabes. In such cases an examination of the "knee jerk" may at once indicate the character of the case.

Dr. Erb maintained, in a communication in German, that a large proportion—almost all, indeed—of the cases of tabes (locomotor ataxia) owe their existence to syphilitic infection. In the discussion which followed, whilst this pathogenetic factor was admitted to be very influential, it was not held to be so universal as considered by Erb. All who took part in the discussion, except Rosenstein, of Leyden, refused to accept Erb's assumption, and these were Althaus, of London; Gairdner, of Glasgow; Lancereaux, of Paris; and Zambaco, of Constantinople. The subject of nerve-stretching for the relief of this disease, was introduced by Dr. Carl Langenbuch, of Berlin. All agreed that in most cases some benefit resulted, and, in many, a remarkable improvement ensued. Amongst those engaging in this discussion were Erb, Müller, Benedikt, Grainger Stewart, and Eulenburg.

A very thorough memoir on Addison's disease was presented by Dr. Greenhow. Having in his Croonian lectures discussed the nature of this peculiar malady, and having made it the subject of special study since, he here presents the latest results of his investigations. He holds that the remarkable asthenia, the strange pigmentation, and the other phenomena of this disease, have their origin in an inflammation of the suprarenal bodies, and of the neighbouring nerves composing the solar plexus. In the discussion which followed, the most emphasis was laid on the changes in the solar plexus.

A very suggestive paper was read by Dr. Clifford Allbutt, of Leeds, *On the Treatment of Scrofulous Glands*. He maintained a doctrine coincided in by all who took part in the discussion, that scrofulous disease of the cervical glands often has its origin in affections of the throat, teeth, ears, and of the skin of the face. Once glandular suppuration is inaugurated, an extension of the disease may take place to the bronchial glands, to the lungs, etc. At first, therefore, it is a purely local affection, and the treatment should correspond. He advocates extirpation of the affected glands at once, and before diffusion takes place, and the cases narrated, certainly, confirm the accuracy of the deduction. The disease seems to be promptly cured, and the deformity is trivial compared with that due to the suppurating sinuses.

The subjects of the relation of gout and rheumatism, by Mr. Hutchinson, and of eczema and albuminuria in relation to gout, by Dr. Garrod, gave rise to free discussion. Mr. Hutchinson maintained that there is a close relationship between rheumatism and gout, and that rheumatoid arthritis is properly an admixture of the two. These rather retrograde opinions were warmly opposed by Dr. Duckworth in an excellent speech, and also by Dr. Garrod. The presence of albumen in the urine in gouty subjects is due, according to Garrod, to the deposit of urate of soda between the tubuli. This takes place, as his statistics show, in about one-fourth of all the cases. Eczema is also a frequent concomitant of the gouty diathesis, occurring, according to Garrod, in eighteen per cent. of the cases.

The various forms of Bright's disease was discussed in papers by Prof. Grainger Stewart, of Edinburgh, by Prof. Rosenstein, of Leyden (in German), by Dr. George Johnson, of London, and by Dr. F. A. Mahomed, of London. We have already referred to several papers submitted to the Pathological Section. Stewart's paper is clinical chiefly, and is occupied with the examination of the urine as a means of diagnosis; Rosenstein treats elaborately of the distinctive forms of Bright's disease; and Dr. Geo. Johnson discusses the diagnosis of Kleb's glomerulo-nephritis. All of these papers possess a high degree of merit, and well deserve a more extended examination than is possible in this review. A paper nearly related to these subjects appears elsewhere in the proceedings; it is by Dr. Lancereaux, of Paris, and is entitled *Néphrite et Arthrite Saturnine*. It is intended to prove the coincidence of these affections, and to show the correspondence between the plumbic and the gouty affections.

Prof. Austin Flint, Sr., of New York, read a valuable paper, entitled *An Analytical Study of Auscultation and Percussion, with Reference to the Distinctive Characters of Pulmonary Sounds*. This piece, as is usual in his work, makes the impression of thoroughness, sincerity, and ability. It is intended to simplify the methods of auscultation and percussion, and to make them more precise in their application. This paper is followed by a "note on the value of Baccelli's sign, in the differential diagnosis of pleuritic effusions." This sign consists in the transmission of a whisper through serum; whereas it is inaudible if the fluid be purulent. The ear is placed at the inferior angle of the scapula, and the patient is directed to whisper "one," "two," "three." Dr. Douglas Powell, who presented the paper, narrates a number of cases in which Baccelli's sign was of distinct value associated with other signs of pleuritic effusion, but it is by no means infallible. Prof. Ewald, referring to it in the course of the discussion, maintained that the best means of differentiating as to the characteristics of the fluid is to withdraw some by means of the syringe.

A distinctly new malady is described by Dr. Roberts, of Manchester, under the title *Bacilluria*, and is a form of urinary disorder in which rod-shaped bacteria are discharged in the urine. The symptoms are, in the main, those of irritation of the urinary organs, and are similar to those due to the presence of stone in the bladder. The urine is acid in reaction, opalescent, and full of bacteria; it does not decompose readily, does not become ammoniacal, and there are not present the organisms of putrefactive decomposition. The administration of full doses of salicylate of soda acted promptly in affording relief.

One of the most imposing in respect to length, and practical in respect to character, is the paper by Dr. C. Theodore Williams, of London, on

The Treatment of Phthisis by Residence in High Altitudes. The conclusions reached are that curative effects are obtained from sufficiently prolonged residence in mountain altitudes. The capacity of the thorax increases, the breathing power becomes greater, and the character of the local morbid process is gradually modified. Dr. Hermann Weber, and Dr. Wilson Fox, of London, Dr. Herbert, of Paris, and others taking part in the discussion, coincided with Dr. Williams in the favourable view taken of the influence of altitude on the progress of pulmonary consumption.

We find in the proceedings of the Medical Section other papers of less importance than those above referred to, but we cannot do more than merely state that they will, without exception, well repay reading. We discover nothing in the transactions of the medical or other Sections thus far examined which had better be omitted, except the meaningless remarks of an irregular practitioner (a homœopath we believe) from Cincinnati, who got into the *Materia Medica* Section and amongst the list of members by some process only known to such gentry. It is to be regretted that greater care could not have been exercised in scrutinizing the credentials of supposed regular physicians, who, coming from a distance, had no authority to represent the local medical bodies. Where the number reaches so large a proportion as three thousand, it becomes difficult to give sufficient examination to the credentials of every person coming forward for registration. Furthermore, it is impossible under such circumstances to ascertain the genuineness of papers supposed to be given by distant and unknown associations.

The only part of the third volume which comes within our province is the proceedings of the Section of Mental Diseases. Dr. C. Lockhart Robertson presided, and the vice-presidents were Drs. Crichton Browne and Henry Maudsley. The only representative from the United States was Dr. A. E. Macdonald, of New York; the only representatives from foreign countries were Prof. Benedikt, of Vienna, Drs. Foville, Motet, and Lasègue, of Paris, and Prof. Tamburini, of Italy. The proceedings, although of fairly good quality are rather meagre. The inaugural address of the president on *The Present Condition of the Insane in England* was most appropriate and also thorough in the treatment of the subject. The much discussed question of the increase of insanity in England, is by Dr. Robertson, answered in the negative. He finds that the ratio of insane to every 10,000 of population was in 1860 19.1, and in 1880, 27.9, but the variation is in the pauper class, amongst whom the increase of lunatics is merely apparent, and due, as the Scotch commissioners in lunacy say, to "an increasing readiness to place persons as lunatics in establishments." There are 43,700 lunatics in the public asylums of England, and of these 40,000 are paupers. About 43 per cent. of the private insane are in private hospitals which are licensed and visited by the lunacy commissioners. The cottage system has also been adopted with considerable success in Scotland, and is now being introduced into England. The whole of Dr. Robertson's address is full of important matter, which may be read with profit by all interested in such questions. The president's address is followed by a paper on *Mégélonie* by Dr. Foville, of Paris. This term proposed by Dagonet, applies to cases of mental derangement with ambitious and expansive notions, and is distinguished from dementia paralytica, in that the delusions are fixed, systematic, and progressive. Dr. Fournié, of Paris, presented a paper on the physiological pathology of

hallucinations, which was concerned chiefly with a proper classification. He maintains that the mechanism of hallucinations is the same as that of normal memory, and they should be classified according to the function involved.

Dr. Haller, of Vienna, and Dr. Savage, of London, gave accounts of modes of preparing microscopic section of nervous tissue, and Dr. Clouston, of Edinburgh, discoursed on the teaching of psychiatric medicine. Prof. Ball read a paper on the mental derangements of paralysis agitans, concluding that such mental derangement is more common than is supposed, in the slightest cases consisting merely of irritability, and in the severest of insanity. He finds, further, that there is no connection between the severity of the symptoms, and the impairment of the faculties.

There are two elaborate papers on allied topics; the first, *On some Cranial Characteristics of Idiocy*, by Dr. Shuttleworth, and the second, by Dr. Beach, *On the Morphological and Histological Aspects of Microcephalic and Cretinoid Idiocy*. No mere abstract will do justice to these papers. Dr. Benedikt, of Vienna, presented a paper on the *Brains of Criminals*, the lesson of which is that "there exists another type of human brain, divergent from the natural one, and most of my criminal brains belong to that type." It follows that a brain being given, an expert will determine the moral type of the individual. Dr. Crichton Browne held that Dr. Benedikt's examples were brains of a simple type, undeveloped, and that he would fail to pick out twenty brains of criminals mixed with a hundred brains of ordinary people.

Besides the foregoing, papers were read by Dr. Hack Tuke on "Mental stupor;" by Prof. Lasègue, on "epilepsy;" by Dr. Bucknill, on "testamentary capacity;" by Dr. Ashe, of Dublin, on "the race relationship of general paralysis;" on "moral insanity" by Dr. Hughes, of St. Louis, United States, and others of less or greater value, of which abstracts are given.

We have for consideration, finally, the proceedings of the Section for Diseases of Children. This seems to have been one of the most successful of the Congress. Its work is recorded in 232 pages, and representative men in this department of medical practice participated. The Section was presided over by Dr. Charles West, and amongst the Americans present were Drs. Jacobi, J. Lewis Smith, and Sayre, of New York. We cannot praise the address of Dr. West. He apologizes, it is true, for lack of opportunity to prepare a suitable one, but he exhibits lamentable deficiencies when he attempts to sketch the progress of knowledge in the department of children's diseases. Four elaborate papers were devoted to *Rötheln*, or German measles, by Drs. Cheadle, of London, J. Lewis Smith, of New York, Shuttleworth, of Lancaster, and Squire, of London. It was concluded that the disease corresponds neither to measles nor scarlatina and is not preventative of either, and is, consequently, a disease *sui generis*.

A series of papers on rickets followed: The first by Prof. Parrot, of Paris, who maintains the identity of rickets and secondary syphilis; the second by Dr. Bouchut, who strongly controverts the opinion of Parrot, and the third by Dr. Rehn, of Frankfort, who, also, is opposed to the view of the causative relation of syphilis. In the discussion which followed, only Dr. Gilbert, of Havre, supported Parrot; Dr. Jules Guérin, Prof. Ranke, of Munich, Dr. Sansom, of London, Dr. Robert Lee, of London, and Dr. Jacobi, of New York, opposed his views.

Several papers on diphtheritic paralysis followed—from Dr. Jacobi, of New York, Dr. John Abercrombie, of London, and Dr. Squire, of London. The main diagnostic symptoms, according to Jacobi, are the first occurrence of the paralysis in the pharynx and ocular muscles, the irregularity in the diffusion of the symptoms of paralysis, and the intact condition of the sphincters. The spread of diphtheria and its contagiousness, were the subjects of elaborate papers by Drs. Hubert Airy, of London, and Jacobi, of New York.

The subject of chorea in children, and its relation to rheumatism, was discussed in important papers by Dr. Steffen, of Stettin, Dr. Stephen Mackenzie, and Dr. Sturges, of London, Dr. J. W. Byers, of Belfast, and Drs. Barlow and Warner, of London. The point of most novelty in this discussion was the subject of the last-named memoir. Drs. Barlow and Warner describe cases of rheumatism and chorea in children, characterized by the occurrence of subcutaneous nodules, connected with fibrous tissues, and having the usual type of rheumatic inflammatory products. The intimate relation of chorea and rheumatism was urged in all the papers. Changes in the mitral valve were described by several observers, when no bruit and no rheumatic symptoms existed during life. The embolic theory of chorea receives support from these facts, but as yet no direct evidence has been furnished.

The subject of the changes in the permanent teeth, of syphilitic origin, was the subject of a paper by Dr. Magitot, of Paris. In the discussion which followed, Mr. Hutchinson being the principal speaker, it was clearly brought out that the deformity of syphilitic origin was readily differentiated from those due to mercurialismus, stomatitis, etc. What is known as the "honeycomb tooth," is, as Dr. Magitot and Mr. Hutchinson both asserted, not of syphilitic origin. The distinction lies in the fact that the deformity due to syphilis is an arrest of development of a peculiar kind, and not an erosion. "The upper central incisors of the permanent set are affected by an arrest in the growth of the middle denticle, leaving a single central notch." Such is Mr. Hutchinson's statement. Furthermore, he holds that "there is usually a dwarfing of the tooth in all its dimensions, and sometimes a screw-driver form of tooth is almost as characteristic as a notched one."

The application of Sayre's jacket, its uses and abuses, and the accidents sometimes resulting, were discussed in papers, by Dr. Da Cumba Bellem, of Lisbon, Mr. Golding-Bird, of London, Mr. Henry F. Baker, of London, and Mr. Walter Pye, of London. Dr. Sayre was present and took part in the discussion. He showed how errors had crept into the matter of jacket treatment of spinal injuries, for which he was not only not responsible, but against which he had protested from the beginning. The Vice-President, Mr. Holmes, in summing up the results of the discussion, indicated the various difficulties connected with the application of the plaster jacket, some of which are not surmounted, but his final conclusion was expressed in these words: "The general opinion seems to be that this is a real and a great advance in practical surgery."

Two papers were read on the nature of the scarlet fever which sometimes follows operations on children, and it was decided that this is really a scarlet fever of coincident appearance and is not due to the surgical procedure.

A number of papers appear on the treatment of genu valgum, but as this is a purely surgical topic, we pass on to consider those of medical

character. The surgical treatment of strumous affections, and resections of joints were topics of great interest to which we can merely refer. A practical paper on the solution of the false membrane of diphtheria by the new digestive principle—papaine—was read by Dr. Bouchut, of Paris. He employs a solution of two grammes of papaine (about 3ss) in eight grammes (about 3ij) of distilled water, to which is added five centigrammes of salicylic acid. Of 46 cases treated by the local application of this solution, 40 were cured. Finally, a practical paper, by Dr. Madden, *On Some Points in the Etiology and Treatment of the Tuberculous and Scrofulous Diseases of Infancy and Childhood*, closes the proceedings of the Section. It is a discussion of the various expedients, dietetic, medicinal, and climatic, employed in the treatment of these affections, and, although useful, is not new.

In closing this review of those portions of the proceedings allotted to us, we can but re-echo the plaudits bestowed on the work of the great Congress. Our readers, we doubt not, will agree with us, that the scientific work of this illustrious body of *savants* was not obscured by the social success of the meeting. Notwithstanding the attractions of the great capital, and the excursions and entertainments, the proper work of such a Congress was not neglected. Our own annual gatherings may profitably contemplate such an example, and learn the useful lesson, how to combine a high order of scientific and professional work, with due attention to social enjoyment.

R. B.

If the International Medical Congress of 1881 had accomplished nothing else, a glance at the handsome volumes in which its transactions appear would prove that it had contributed a vast amount of material to medical literature. When the character and quality of this material comes to be examined, speaking of that which was contributed to the Surgical Section of the Congress, we can pronounce favourably upon it, and can give to it a most hearty commendation without fear of contradiction.

Upon reading the address of the President, Mr. Erichsen, one reason of the eminent success which attended the Congress is very evident, namely, the care which was given to the choice and arrangement of the subjects which were brought before the Section. These were eight in number.

It is equally apparent that the papers read, and the discussions had, upon several of the subjects chronicle the most decided advances in surgery, and it is this feature of the work before us which makes it one of much encouragement to those who look forward hopefully to the future of their science. We have been for many years accumulating observed facts, and the tendency of some observers has been rather to merely show the existence of pathological changes than to speak hopefully of medical measures, but here we have a series of papers principally connected with the therapeutics of surgery.

Mr. Erichsen points out that, while some of the new measures recommended are only novelties, or reversions to old methods, others mark most decided and almost astonishing advances in treatment.

The first subject before the Section was the *Treatment of Aneurism by the Elastic Bandage*, and as we have, in the previous issue of this Journal, given a full notice of Mr. Gould's paper upon it, we shall pass it by to take up the consideration of the next topic.

This was practically abdominal surgery, the most important subject which came before the Section, and the one in which the most revolution-

any practices have been successfully introduced of late years. The opening paper on *Recent Advances in the Surgical Treatment of Intra-peritoneal Tumours*, by Mr. T. Spencer Wells, will be read eagerly, as embodying the views of one whose experience is almost unique in its extent, and who himself has had so much to do with these advances. After a brief summary of the progressive steps which have been taken within the memory of men of middle age, Mr. Wells devotes himself to those points which he thinks have had much to do with the improved success that attends operations upon the abdomen. The first of these is the union of divided edges, or separated surfaces of peritoneum. Mr. Wells exhibited the specimens by which, in 1859, he proved that the serous surfaces must be brought in contact with each other in order to secure adhesion, while the edges of the structure are everted, just the opposite of the conditions required where cutaneous incisions are involved. This has long since become axiomatic in surgery, and Mr. Wells tells us that he should not have thought it worth while to refer to it had he not been attacked by some foolish people, who assailed him, because, to ascertain the facts, he found it necessary to inflict pain upon, and even deprive of life, some brutes. Woman has been the principal gainer by Mr. Wells's experiments, and yet women will give time, money, and life itself, to societies which, while seeking to protect brutes from cruelty, actually promote cruelty to humanity. Mr. Wells gives the second place in his enumeration of advances, to the clip forceps, which are applied temporarily to restrain hemorrhage, and are most effectual in diminishing the loss of blood. The third, and last point upon which Mr. Wells dwells, is the mode of dressing. He does not go into the subject at length, as the antiseptic method is made a theme by itself, but he tells us that, while he adopts an antiseptic dressing, he has not found it expedient to use drainage-tubes for three years, and that he thinks he has been largely a gainer by their omission.

Mr. Lawson Tait follows, with some remarks upon the whole subject of *Abdominal Surgery*, and a brief narration of the wonderful results achieved by him. Of those results the readers of the Journal have been informed by Mr. Tait himself, in an article, contributed to these pages. It is sufficient to say that it becomes apparently a mere matter of diagnosis in many cases, and provided that can be made with accuracy, we may hope to remedy many conditions, which, a very few years since, were irremediable. Altogether Mr. Tait has opened the cavity of the peritoneum, for various reasons, no less than sixty-six times within the last few years, with a total mortality of 4.5 per cent. Certainly a most remarkable showing, and one which our immediate predecessors would have regarded as impossible. When we come to inquire into the causes for this great change, we do not find it in the much-vaunted system of Lister, for neither Mr. Tait nor Dr. Keith use carbolic acid, though they do use thorough drainage. We naturally suppose, therefore, that in drainage is to be found that which has caused all this transformation, but Mr. Wells, it will be remembered, claims to have omitted drainage-tubes with advantage, while still adhering to modified Listerism.

The difficulty of arriving at a definite and decided conclusion in this matter was well illustrated by the discussion which followed the opening papers, in which Thornton, Keith, Bantock, and Heywood Smith, of Great Britain, Martin and Volkmann, of Germany, and Marion Sims, Wilson, Marcy, and Dunlap, of this country, took part. When some of these adepts deny the virtues of carbolic acid and exalt those of drainage, while

others hang their confidences upon antiseptics and think little of drainage, and some rely upon neither, it is evident that the real cause for the great modern improvement in the treatment of these cases lies deeper. As we read over the remarks of these authoritative speakers, and compare them with our own experience, we think three elements lie at the foundation of the matter: 1st, wounds of the peritoneum are not so dangerous as they were once supposed to be, especially 2d, when proper antiseptic precautions are observed. By antiseptics we do not mean any of the special agents which have been considered to possess such virtues, but rather that attention to cleanliness, which will prevent the admission of any ferment which may hasten putrefactive changes, and that attention to securing a free exit to any accumulations of fluid, which, when pent up, undergo putrefaction, and then become active septic agents. The third element of success, we think, is to be found in the improved methods of operating, which, by a more minute attention to details, in lessening hemorrhage, and therefore shock, and in leaving as little fluid in the abdominal cavity as possible, diminishes very much the dangers resulting from putrefactive changes.

The Diseases of the Kidney which admit of Relief by Surgical Interference, was the subject which next occupied the attention of the Section. Papers were read by Prof. Czerny, of Heidelberg, and Messrs. Baker, Barker, Lucas, and Barwell, of London. Prof. Czerny's communication contains a table of no less than 72 cases of operations upon the kidney. Mr. Barker's paper consists of a critical examination of the merits of the operation, which has for its aim the removal of stones situated in the kidney or its pelvis. He thinks that an early diagnosis can often be made by palpation, by the existence of pain, and by the presence of hæmaturia, and he recommends the exposure of the kidney, and its exploration, if necessary, by punctures with a fine needle, and does not believe the integrity of the organ will be seriously affected by the proceeding. Mr. Barker lays much stress upon the importance of an early operation. He thinks that when several small stones exist, when one large one is present, or the pelvis is extensively encrusted with calculous matter, removal of the entire organ offers much the best prospect of success; but that where only one moderately-sized calculus is revealed by the preliminary exposure of the kidney, it is best to remove it by an incision into the organ. The question as to how late, in the progress of these cases, it is justifiable to resort to nephrectomy is one of much difficulty, and cannot be settled by general rules. Each case must stand by itself, and a decision be arrived at by a careful study of the special symptoms present. The other papers are narrations of cases, and we confess, to some surprise, that the discussion that followed was neither extended nor exhaustive.

The paper with which Sir Henry Thompson introduced the subject of *Recent Advances in the Methods of Extracting Stone from the Bladder*, is judicial in tone, and most instructive. He points out that in the long-established operation of lithotomy there has been little change, while in lithotritry and its modifications, there have been most decided ones. These changes have consisted very largely in instrumental inventions, and in the modes of their application. Thus he regards the method of Bigelow as a bolder and more extended application of the recognized principles upon which lithotritry has been founded, viz., crushing the stone and washing out the debris, by a more powerful lithotrite, a larger catheter, and a stronger suction apparatus. Dr. Bigelow was led to the adoption of these

instruments by his conviction of the desirability of removing all calculous material *at one sitting*. It is in the prominence given to this principle by it, that Sir Henry Thompson appears to think the chief value of Bigelow's method consists. He points out that in some cases the principle can be very well carried out, without always resorting to the larger and more powerful instruments. The real value of Dr. Bigelow's principle, however, is shown in the fact that Sir Henry has very largely adopted it, and that during two years he and his assistant, Mr. Browne, have remedied no less than 104 cases of calculous disease by the one-sitting method. These, together with eleven cases, in which lithotomy was resorted to during the same period, are given in an appendix. They furnish no aid in determining the value of Dr. Bigelow's special apparatus, as the character of the instruments resorted to in each case is not mentioned. We have thought it important to give the carefully reasoned opinion of Sir Henry Thompson, as entitled to every consideration, both from the careful thought it evidences, and the vast experience which entitles him to speak with authority. First, it is unwise to use larger instruments than will fulfil the indication, as, while some urethræ exhibit a greater tolerance of distension than was formerly supposed to exist, in others a marked intolerance of such large catheters as are now frequently used, is manifested. The instrument should always be adapted to the size of the stone, and the surgeon should always aim at its removal by the smallest possible amount of mechanical action. The larger and more powerful instruments should only be used when the stone is of larger size than it has been found practicable to remove by the older and smaller apparatus. The neglect of this rule will bring discredit upon lithotripsy, while, on the other hand, to resort to lithotomy in the case of a small stone, which could be easily and rapidly crushed, is to neglect the resources of our art. The importance of a correct diagnosis, so that the means may be adopted to the special case, and the early detection of the disease, are the second and third points upon which Sir Henry insists. The "perineal lithotripsy" of Dr. Dolbeau is recommended in certain rare cases, and it is pointed out that where the stone is very large it is much better to crush it with a proper lithotrite, than to insist upon its removal entire through the lithotomy incision.

Dr. Bigelow follows in a thoroughly illustrated and well-written article describing the instrumental modifications he has lately devised with a general discussion of lithotripsy. A good *résumé* of the subject is given. We incline to think that somewhat undue prominence is given to the extreme importance of special skill in the operation of lithotripsy. There is nothing that tends more to deter surgeons from the adoption of a new operation than this talk about the very special skill required for its performance. Accurate anatomical knowledge, gentleness tempered with boldness, and a conscientious painstaking, very generally enable a surgeon to do any special operation sufficiently well for the good of the patient. We take it that the use of ether in this, as in other operations, has done much to deprive the surgeon of the advantage which at one time waited upon great manual dexterity and deftness. No doubt skill will accompany experience, but sufficient adroitness will generally be at the command of the fearless, gentle, and conscientious surgeon.

In the discussion which ensued upon this most important surgical procedure, some of the most eminent men present took part, and it is pretty evident that in their opinion the method of Professor Bigelow is regarded as a most important advance, and one which has done very much to extend

the scope of lithotrity. There can be no doubt that this is the case, and that a grand step has been taken in advance. While claiming the most cosmopolitan and catholic views upon professional subjects, we may be pardoned a little feeling of self-congratulation that America, in the device of Professor Bigelow, has contributed another to the many valuable measures she has given to surgery.

The Relations between Adenoma, Sarcoma, and Carcinoma of the Mammary Gland in the Female; their Diagnosis in the earlier stages of the Disease, and the Results of their Treatment by Operation, was the subject of an able paper by Professor S. W. Gross, of Philadelphia, in which he advocated an early and extended operation, holding that when carcinoma exists, the best hope for safety lies in the removal of the entire organ, the overlying skin, and the axillary glands.

Resections received considerable attention. Professors Ollier, of Lyons, and Kocher, of Berne, read papers, while Dr. Sayre narrated the history of a case in which the hip-joint was reproduced in the person of a very much diseased child. From the cut furnished, a very close resemblance appears to exist between the side from which the joint was removed, and that in which it was left intact. Dr. Sayre also gave a synopsis of seventy-one cases of exsection of hip-joint for morbus coxarius. The discussion which followed was taken part in by many eminent men, and the drift of sentiment seemed to be in accord with the conclusions of the Clinical Society's committee, that while life is prolonged by a resort to excision, such a resort should not be made until it becomes evident that the progress of the case is downward, and the hope of guiding it to a successful issue is lost. Several speakers drew attention to the fact, which is so patent to those who have had much experience with these cases, that when recognized early, and subjected to proper treatment in the first stage, a good result is the rule.

Dr. Sayre's own synopsis of his cases does not present a picture sufficiently attractive to lead surgeons to generally follow his example. Out of a total of seventy-one cases of hip-joint exsection, he says, "forty-seven are now living with more or less useful limbs, and twenty-four are dead." While Dr. Sayre explains that but nine of these latter died from the exhausting effects of hip-disease, we can hardly be surprised that the opinion of the surgeons present seemed to be adverse to an early operation, nor in view of the fact that a large proportion of cases recover with more or less useful limbs without operative interference, can we wonder at the opinion evidently entertained by those who took part in the discussion. At the Children's Hospital, in Philadelphia, where a large number of cases of hip-joint disease are constantly under treatment, the general practice is that laid down by Küster, of Berlin, in the discussion which followed Dr. Sayre's paper, viz., to perform excision only when the general health begins to give way, and the plan has proved eminently satisfactory.

The treatment of wounds was the subject which next occupied the Section, and was discussed in a manner suited to its importance. The introductory paper was by Mr. Savory, who considered the causes of failure to obtain primary union. As a matter of course, the question resolved itself into the merits of *Listerism*. No one failed to declare himself on the side of antiseptic surgery, but in the opinion of Mr. Savory that method is best exemplified by scrupulous attention to cleanliness, and an intelligent waiting upon the physiological process of repair, rather than by any special dressing. Mr. Savory very fairly credited Listerism with having done

much to promote that attention to cleanliness, and general sanitary improvement of the surroundings, which has been conspicuous in the surgery of the last few years, but he altogether denies that better results have followed from the use of carbolic acid, or any other so-called germicide, than has been obtained at St. Bartholomew's Hospital and elsewhere, without such agents. In support of his position he fearlessly appealed to the statistics he has compiled, and very properly maintained that their magnitude gave them a value which could not be gainsaid. Mr. Savory's speech was fair and able, but there is evident in it a sense of restraint, which would seem to indicate that the opponents of Listerism have been subjected to a kind of criticism, which makes them a little chary of the pronouncement of their opinions in the face of the popular and fashionable current of the day. The discussion which the subject received at the Congress must tend to show that the matter is not to be settled by confident assertion, that it is yet *sub judice*, and that there is developing a well-marked countercurrent, which had no existence a short time back. This countercurrent Mr. Savory represents very correctly, and the majority of those who spoke expressed themselves as very nearly in accord with his views, which are antiseptic, but not Listerian.

The importance of the subject is so great, and the standing of the speakers such, that we think it well to indicate the opinions expressed by each. Mr. Gamgee depends upon position, presence, rest, and perfect drainage, either by absorbent pads or drainage-tubes. Professor Humphrey relies upon the prevention of fluid accumulations in wounds, with extreme attention to cleanliness, and he regards antiseptic agents and drainage-tubes as valuable adjuvants in fulfilling these indications. Professor Volkmann, of Halle, is an outspoken advocate of the extreme Listerian views. He knows no suppuration independent of organic ferments. Perfect apposition and perfect disinfection are, in the opinion of Volkmann, the essential prerequisites to obtaining primary union, and perfect disinfection can only be obtained by the use of a germicide. The Professor announced himself as representing the views of those German surgeons who have adopted the Listerian method, and his views are certainly sufficiently definite and pronounced to suit even the first advocate of that method. Professor Esmarch, of Kiel, is also a Listerian, but he adopts a modification of the details, which he terms a permanent dressing. It consists of a compress soaked in a solution of iodoform in absolute alcohol, a similarly soaked bandage, and an enveloping elastic one. The escape of secretions is promoted by round holes in the skin made by a punch-forceps, through which are passed absorbable cartilaginous drainage-tubes. This dressing is not changed, and it is claimed to be most effectual. Indeed, the array of figures is most imposing, and one is almost inclined, upon reading them, to suppose that failure cannot attend its use, and that death cannot follow an operation at Kiel, unless by an unavoidable accident. If others have the same success with this dressing the ultima thule has been reached, there is no necessity to seek further. When a man has 388 considerable and capital operations, with only 7 deaths, and all of those occurring from some accident, he is unreasonable if he desires greater success to attend his career as an operating surgeon. Mr. Lund, of Manchester, announced his coincidence with the views of Mr. Savory, and his conviction that in perfect cleanliness there is the best prospect of obtaining perfect asepsis. The late Professor Greene, of Portland, whose death on his way home from the Congress caused so much regret, very

properly protested against being ranged among the opponents of antiseptic surgery, because he was opposed to the use of carbolic acid, and referred to the success which he had enjoyed by attention to cleanliness, drainage, perfect apposition, and an external dressing of cotton-wool.

Dr. James Hardie, of Manchester, spoke briefly in advocacy of applying elastic pressure externally, by means of sponges, without drainage, aiming thereby to prevent discharge, rather than to provide for its absorption, although the sponge fulfils this latter indication admirably.

Mr. J. K. Barton, of Dublin, narrated his experience in treating sinuses by means of stimulating injections and an antiseptic dressing. Mr. F. J. Gant, of London, then gave his experience at the Royal Free Hospital, and announced his opinion that where the atmospheric and surrounding hygienic conditions are equally good, he was able to see no difference in the healing process of wounds treated by the Listerian method, and in that of those treated in other ways. He gave also some illustrative cases.

Professor Letiévant, of Lyons, while announcing his adoption of the Listerian method, and the very excellent results which it had exhibited in his hands, expressed his conviction that those results were more properly attributable to the cleanliness, and the protection afforded from infected hands and instruments by Listerism, than to the theory that wounds are contaminated by floating atmospheric germs.

To Mr. Lister it very naturally pertained to close this interesting and most important discussion. He spoke at length, and his remarks, having been extended before being printed in these transactions, are of much greater bulk than the utterances of any other single individual. Mr. Lister begins with expressing his surprise at the secondary place assigned to antiseptic measures by some of those who had taken part in the discussion. By antiseptic, of course, he must mean his own methods, for the sketch we have given sufficiently shows that all who spoke advocated antisepsis; none were foolish enough to favour septic measures, though they did not hesitate to dispute the correctness of Mr. Lister's theory, or to decline to adopt his peculiar methods. For our part we confess to some surprise to find Mr. Lister, to whose enthusiasm we owe so much, contending so vigorously for his personal theory. Like the Bourbons he seems to have forgotten nothing, and to have learned nothing, or he certainly would discern the signs which indicate a very decided change in the opinions of those who, at one time or other, have fallen in with his views, and he would be inclined to attach more importance to the ability and experience of those who took grounds against his theory.

After stating his reasons for thinking that the operation of ovariectomy was not suited for the exemplification of his method in its present state of development, he goes on to give the reasons which he thinks account for the great success which has attended this operation where none of his special antiseptic precautions are observed. Those reasons are the attention paid to cleanliness, together with the peculiar vitality and absorbent power of the vast peritoneal surface, and the unlikelihood of tension occurring in it. The remainder of Mr. Lister's speech is occupied with the narration of some experiments which have convinced him that the serum of the blood is not so well suited for the growth of micro-organisms as he had at one time supposed, and that the interposition of a layer of lymph, or a thin blood coagulum was often sufficient to prevent the extension of the inflammatory process, and by protecting the deeper parts from the air to really act as an antiseptic dressing. These observations he con-

siders as amply accounting for the success of M. Guerin, Mr. Gamgee, and others, with dry dressings. While he very fairly expresses himself as willing to modify the steps of his process, should experience prove that they can be done without, he seems to us altogether to fail in comprehending that these latest and very special observations of his own, as well as the abundant evidence furnished by several of those who spoke, threaten to entirely overturn his theory, and to do away, not only with the spray, but with the whole cumbersome apparatus necessary to carry out his method. If coagulated serum or blood will make a wound antiseptic why not rely upon it alone. He naturally points with pride to Prof. Esmarch's results with a permanent aseptic dressing, and appeals to the oft-quoted instances of fractures, and other subcutaneous wounds, as unanswerable arguments to prove the correctness of his theories. Whether a close analogy between fractures and wounds, involving chiefly the soft parts, can always be made out, or whether the absence of acute inflammatory processes, so generally observed in fractures, can be proved to be always dependent upon the exclusion of the air, and its death-causing germs, are questions of importance, and cannot be dealt with here.

Numerous other papers were read before the Surgical Section of the Congress, and some of them possessed much individual interest, but they are incapable of being grouped together, and we cannot, therefore, speak of them in a review, which dealing with but a very small portion of these transactions has already attained such dimensions. Excepting a paper in which *the duality of venereal sores* was maintained very ably by Dr. Drysdale, and opposed with characteristic force by Mr. Hutchinson, we have now referred to all the discussions which took place. This was the limit we assigned ourselves at starting out, when even a cursory examination of the volume showed us that a selection must be made from the wealth of material included in its contents.

It remains but to make a few remarks upon the general character of the papers presented to the Congress, and now given permanency in its transactions. With very few exceptions they are noticeable for their brevity, and while brevity is regarded as the soul of wit, it is an excellence of even greater merit in these days of profuse publication. Brevity is not alone sufficient to make a readable article, but it goes a great way to secure general perusal, and he who neglects it must present many other excellences if he would secure the general ear of the profession. But the articles in this volume are more than brief, they are practical, both in the subjects treated and in the manner of treating them. In them is exhibited the efforts of men who are daily in the habit of grappling with perplexing issues, which involve the future of our science, and its beneficence to sick and suffering men. Nor, when we say that these articles are brief and practical, have we exhausted the terms of praise properly due to them; they have besides the weight which attaches to experience, for they come from the minds of men who have based their theories upon observation, and subjected them to the trying test of experience. And now we have exhausted our catalogue of commendations, brief, practical, and experimental, we know nothing better to be said of medical papers, and to most of the papers in the portion of the volume which has passed before us in review, these epithets do properly belong. The expedition with which these volumes appeared was on a par with the general excellence of the arrangements which prevailed at the Congress, and in a measure accounts for a good many typographical errors which appear in the text. S. A.

ART. XX.—*Transactions of State Medical Societies.*

1. *Transactions of the Medical Association of Georgia. Thirty-second Annual Session, 1881.* Edited for the Association by A. SIBLEY CAMPBELL, M.D., Secy. Augusta, Ga.
2. *Transactions of the Indiana State Medical Society, 1881. Thirty-first Annual Session.* Held in Indianapolis, May 17, 18, and 19, 1881.
3. *Transactions of the Medical and Chirurgical Faculty of the State of Maryland at its Eighty-third Annual Session.* Held at Baltimore, Md., April, 1881.
4. *Transactions of the Michigan State Medical Society, for the year 1881.* No. 1. Vol. viii. Lansing, 1881.
5. *Transactions of the Minnesota State Medical Society, 1881.*
6. *Transactions of the Mississippi State Medical Association, at the Fourteenth Annual Session.* Held at Winona, April 6, 7, and 8, 1881. Jackson, 1881.

1. THE handsome volume of *Transactions of the Georgia Society* contains a number of practical papers, two of which are illustrated by woodcuts; and the Report on Necrology contains a portrait of Dr. Robert Irvine, and a heliotype print of Crawford W. Long, the reputed discoverer of anæsthesia. The latter accompanies an interesting illustrated paper, by H. H. Carleton, M.D., in which the claims of Dr. Long are re-stated, in the hope that the members of the profession throughout the country may make "a united effort to secure from the National Government a final and official recognition of Dr. Long's claim."

Among the more important papers presented was one by Dr. R. J. Nunn, of Savannah, on *Female Diseases*, which are attributed largely to errors in habit and hygiene during childhood and puberty. In the treatment of backache he recommends the use of igni-puncture with a special needle used with Paquelin's cautery.

Dr. Thomas R. Wright reports three cases of *compound comminuted fracture of the leg*, in which recovery occurred without suppuration. The dressing was of the simplest character; the wound was sealed with adhesive plaster, extension applied, the parts moulded into position, and the limb placed in a fracture-box and surrounded by raw cotton or wheat bran. The non-occurrence of suppuration was attributed to the use of quinine, given in five-grain doses two or three times daily.

Two remarkable cases of incised penetrating *wound of the abdomen, with protrusion of the intestines* (in one the duodenum was opened), are reported by Dr. Philpot, both of which recovered; they were negroes; and Dr. A. Sibley Campbell reports a case of *Gunshot Wound of the Abdomen*, followed by fecal fistula, spontaneous closure and recovery. No Listerian precautions were thought of, and the carbolic spray was conspicuous by its absence.

In the *Report of the Section on Gynecology for the Seventh Congressional District*, the chairman, Dr. S. H. Stout, gives his personal experience in the treatment of puerperal convulsions: out of 988 cases of childbirth he has seen only six of eclampsia, four were primipara, two multipara. In all of these the conservative effect of efficient venesection was strongly manifested; whether hysterical or apoplectic, the influence of repeated and free

blood-letting, he says, was too decided to be denied, all were treated in the same way, and all recovered.

In a paper on *Nævus*, by Dr. W. F. Westmoreland, is the report of a case of nævus of the upper lip in a negro, illustrated by wood-cuts, strongly resembling, almost identical, with one operated upon by the late Professor Pancoast, at the Jefferson College Clinic, and afterwards published in Gross's Surgery. Dr. Westmoreland, in this and other cases, insisted upon the now well-established principle of surgical interference, by the ligature, actual cautery, or similar vigorous treatment, as soon as it is evident that the nævus, however small, is increasing in size.

2. Mainly through the efforts of a special committee, of which Dr. Thad. M. Stevens was chairman, an act regulating the practice of medicine in *Indiana* was passed by the Legislature. The law as it now stands, is, in its principal features, similar to that in force in Michigan; having, however, some features engrafted from the Massachusetts law; and provides for a State Board of Health, consisting of five members, four to be appointed by the governor, and a secretary, to be by virtue of his office a member of the board, and its executive officer. He is health officer of the State. Local boards are also provided for. In each county the county commissioners constitute the health board; in cities, the city council; and in towns, the board trustees. Each local board is completed in its organization by the election of a secretary, who shall be a physician, and in counties, in addition to the duties devolving upon him as health officer of such county, he is to take care of the sick in the county jail. The law also provides for the registration of practitioners, and the collection of vital statistics.

The committee has also urged the passage of laws governing marriage between certain parties (suffering, for instance, from marked hereditary diseases, or derangements, insanity, etc.).

Dr. R. A. Davis reports a *Case of Impaction of the Gall-bladder*, in which 130 gall-stones were discharged through the abdominal wall by supuration and numerous sinuses. A growth resembling cancer subsequently occurred in the right breast, but it was regarded as being independent of the other affection.

In an interesting article on *Infectious Diseases*, by Dr. L. C. Johnson, about twenty experiments with diphtheritic membrane are detailed, which demonstrated the disease to possess a contagium vivum, the activity of which could be destroyed by carbolic acid, or by exposure to cold and heat; and also apparently indicated that it is necessary for the poison to find some other channel of entrance to the system than by the mouth or stomach. Carbolic acid is urged as a prophylactic, and he says, "since I have been using carbolic acid as a prophylactic, there has not been a single instance in my practice, where the acid was used, that the disease has spread to any other member of the family. On the contrary, where the acid has not been used, the disease has in almost every instance spread until all of the children of the family were affected." He administers one minim of the acid in glycerine and water three times daily to children; thorough disinfection of the house and its inmates also is practised.

An improved test for sugar in urine was proposed by Dr. Oppenheimer, in which the copper is kept in separate solution in glycerine, in which it remains permanent.

Dr. Enoch W. King continues his *Statistics of Placenta Prævia*, based upon cases which have already appeared in the *American Journal of the Medical Sciences* for October, 1880, in which very suggestive and important conclusions are given.

The president's address, the report of the Committee on Necrology, and the proceedings and discussions complete this handsomely gotten-up volume, in which the compositor appears to have done his work much better than the proof-reader, as the pages are marred by some unfortunate errors that careful revision would have prevented.

3. The 83d meeting of the *Medical and Chirurgical Faculty of Maryland* was held at Baltimore. As this was also the occasion of the one hundred and fiftieth anniversary celebration of the founding of the city, the Society resolved to participate in the commemoration by holding an adjourned meeting October 13, at which a number of valuable historical sketches of physicians, surgeons, medical societies, journals, and schools, of Baltimore, were read, which are also included in the present volume of transactions.

The annual address before the society was delivered by invitation by Dr. William Goodell, of Philadelphia, on the *Dangers and the Duty of the Hour*, in which a supposed decay of home life in this country is dwelt upon, which is thought to be due largely to the unfitness and unwillingness of many young wives to become mothers. If experience has demonstrated that young men in selecting consorts usually prefer the delicate ones to those endowed with ruddy health, the danger of the hour is only too evident, and a duty in the education of our young men lies in the hands of the profession. If the contrary is the case, and young men really prefer healthy wives, then health will become the fashion and the ladies will vie with each other in order to prove their physical strength, endurance, and activity. We believe that this desirable consummation is now almost attained, largely through the effect of the publication by members of the profession of timely words of warning like those contained in this lecture, in which many hygienic and physiological points are discussed of which the laity are usually ignorant.

In the *Report of the Section on Surgery* a successful case of amputation at the hip-joint by Dr. G. E. Rusk, and two of double amputation of the inferior extremities for frost-bite, by Dr. O. J. Corkery, and other cases and several forms of surgical appliances, are referred to or described.

The *Report of the Section on Practice of Medicine* contains an interesting discussion by the chairman, Dr. R. McSherry, of the subject of tubercle, in which the importance of good hygiene as a prophylactic is insisted upon. Dr. John S. Lynch communicates a *new point in the differential Diagnosis of Cardiac and Pericardiac Murmurs*. He says:—

“Whenever the friction murmur is produced at or near the heart's apex (the only condition in which there will be any serious difficulty in the diagnosis), if we cause the patient gradually and slowly, but entirely, to inflate the lungs, we will perceive that the friction murmur becomes progressively more intense until the act of insufflation is complete. Now make the patient “hold his breath,” while the lungs are in this state of complete insufflation, and the murmur will be steadily maintained at its maximum intensity. Cause him then to expire in a like slow and gradual manner, and the murmur will be found to gradually decline in intensity until its minimum will be reached at the completion of the expiratory act, at which it will be maintained until another inspiration increases its intensity. The murmur does not entirely disappear, however. It is present at all stages of respiration, but always presenting this variation in its intensity.”

Prof. Newell Martin, by invitation, presented a paper describing a *new method of studying the mammalian heart*, illustrated with a plate; and also, in conjunction with W. T. Sedgwick, a *Study of Blood Pressure in the Coronary Arteries of the Mammalian Heart* in which the conclusion is reached that under all changes of pressure or of rate the most complete synchronism prevails, and consequently "the valves do not close over the openings of the coronary arteries during any portion of the cardiac period."

Dr. George M. Sternberg, U. S. N., adds a short paper on a *Fatal Form of Septicæmia in the Rabbit, produced by the subcutaneous injection of the human saliva*, which supplements a paper on the same subject contributed to the *Bulletin of the National Board of Health*.

To the credit of the Medical and Chirurgical Faculty of the State of Maryland, and of the committee upon editing and publishing this volume, it is due to say that its appearance, typography, and literary excellence are equally high, and render it almost unique among the published proceedings of such societies.

4. Seven papers besides the president's address are contained in the Michigan Society's volume in addition to the minutes, list of officers and members, and business details of the meeting.

Dr. C. J. Lundy reports an interesting case of *Acute Glaucoma* cured by the use of sulphate of eserine, in a young man 24 years of age. "Leeches were applied to the temple, and a few drops of a two-grain solution of eserine sulphate were instilled every fifteen minutes, for two hours, and subsequently every hour, for the first day; on the next day it was continued every two hours. On the next day he had reported that he had slept several hours during the night and that he was almost free from pain. All symptoms were much more favourable, and the tension of the eyeball was only slightly above the normal. At the end of four days all glaucomatous symptoms had disappeared, and the patient considered himself well. As a matter of precaution, he was advised to use eserine twice daily for several weeks longer, and to report at once, if all did not go well. Two weeks later vision was found to be normal in all respects." Nearly a year afterwards the patient was found to have had no return of the trouble. The advantages of this method over iridectomy are very obvious, if we could be certain that it would always succeed equally well. It seems certain that eserine must be pushed vigorously and with no timid hand if success is to be expected from its use.

The Treatment at birth of Congenital Clubfoot is advocated by Dr. T. W. Reynolds, in which a moulded splint *applied to the contracted side*, over cotton-wadding, the bandage not going below the metatarsus, the dressing to be daily applied, and the treatment aided by frictions, etc., form the principal features.

Some interesting clinical *Notes upon a Case of Pneumonia* are communicated by Dr. Henry F. Lyster, in which the early use of quinine in large doses is principally advised; and the proper use of alcohol is insisted upon.

Dr. C. Henri Leonard reports a case of *Backward Displacement of the Womb*, and describes a new instrument for its replacement, a uterine repositior, which possesses decided advantages over the ordinary sound, as it does not cause abrasion of the endometrium. The instrument terminates in a movable extremity which can be bent in either direction by turning a thumb-screw in its handle.

Dr. C. B. Burr reports good effects from the use of *Cocculus Indicus* in *Epilepsy* (gtt. i-ij of the fluid extract) three or four times daily. It is particularly adapted to those cases where the patients appear to be in good bodily health, whose convulsive seizures are accompanied by maniacal excitement.

Dr. Eugene Smith says in the *Treatment of Granular Lids* the importance of isolation is based upon the statement that the disease is contagious. When the condition is very marked an application of a saturated solution of acetate of lead is recommended, but strong objections have been urged against the injudicious and improper use of the agent. Caustics also may be cautiously used, but should cease if ulceration of the cornea occur, when eserine or atropine should be instilled, until the ulcer is healed.

When the palpebral fissure is shortened, it is sometimes necessary to slit up the external canthus.

5. The transactions of the *Minnesota State Association* rank high for their intrinsic value among those of sister societies, and are such as would be more than creditable to many of those of greater age and influence. Throughout the volume every contribution shows acquaintance with literature and practice of modern medicine.

The president's address by Alexander J. Stone, M.D., of St. Paul, is devoted to a criticism of the Code of Ethics, in which he recommends some radical changes, but insists upon the duty of the State to protect its citizens by enacting that no physician shall be allowed to practise within its boundaries unless he has given evidence of his thorough qualification.

The principal portion of the proceedings is devoted to reports on Surgery, Gynecology, Diseases of Children, Ophthalmology, etc., which contain valuable summaries of pathology and practice, and include many cases of interest, some of them remarkable. For instance, Dr. C. A. Wheaton reports a case of amputation of the rectum and extirpation of the larynx in the same subject, for malignant disease, also one of ligature of the external iliac artery for hemorrhage from a femoral aneurism, also others of minor importance.

The Committee on Diseases of Children presented a collective report on the subject of *Cerebro-spinal Meningitis*, the result of a circular letter sent out through the State. A number of clinical reports of cases are given; the greatest success seemed to follow the use of ergot, sedatives, and blisters; on the contrary, quinine and ice seemed of little avail. Morphia and bromide potassium with chloral, in full doses, relieved the pains and restlessness, while in one case Calabar bean was very efficient in relaxing muscular spasms. It was generally considered good treatment to administer calomel at the onset, or some other form of mercurial purge.

Among the more valuable articles is one by Daniel Leasure, M.D., of St. Paul, on *Alcohol as a Therapeutic Agent*, which correctly places alcohol among the sedatives and antipyretics in the treatment of disease, and contains some graphic descriptions of cases confirming this view. The physiological action of this agent is also considered, and a most probable hypothesis given as to its mode of action.

Dr. C. N. Boardman, of St. Paul, contributed a short but incisive essay upon *Medical Expert Testimony*, in which the glaring faults of the prevailing methods in use in this country are pointed out, and the necessity for intelligent legislation sharply urged. The method advocated is best described in Dr. Boardman's own language:—

"It provides simply that the court shall be furnished by the counsel, both for plaintiff and defendant, with a list of physicians whom they are willing should be called upon to testify, and that a certain number of these, say three or five, shall be summoned by the court to attend the trial as witnesses; and after hearing the evidence, the medical witnesses thus selected shall (after a consultation, if it be desired) express their opinion by means of the usual examination and cross-examination. The defendant may exercise his constitutional right of summoning his own witnesses, as in Professor Reese's scheme."

From the observation of an epidemic of *Rötheln* Dr. Slagle contributes a good paper, in which the view is supported that it is a distinct disease belonging to the specific fevers, and feebly contagious, and the prognosis in complicated cases usually favourable.

6. The article of most general interest in the Mississippi Society's volume is an address on the *Rights, Duties, and Responsibilities of Physicians before the Courts*, delivered by request before the association, by the Hon. J. S. Morris of Vicksburg, which gives a valuable summary of some of the more important of the medico-legal relations of the practitioner of medicine, and of his standing in court. It contains information essential to be known, and yet usually inaccessible to the physician. As the article is compendious as well as classical we recommend its perusal to all. A few of the points we append.

1. *As to what constitutes a physician before the law :—*

"In many of the States, in England, I believe, and in some of the continental nations of Europe, statutes have been enacted requiring all who would be physicians to obtain a license to practise, annexing penalties of greater or less severity upon all who fail to do so. All who are not licensed are regarded as intruders and offenders, and are not only prohibited from collecting compensation for their services, but are liable to fine and imprisonment. . . . But by the common law of England, which prevails in Mississippi, except as has been limited or modified by positive enactment, every person is a physician who announces himself as such, who can obtain employment in that capacity, and who follows it for a livelihood. 'The law' cannot stop to discriminate between different schools of medicine. Allopathists, homœopaths, botanic doctors, steam doctors—and I do not know but faith doctors—are recognized by the court as doctors, when they have been employed as such, provided that they shall come reasonably well up to the standard of their pretensions, and shall practise no fraud, and shall not take undue advantage obtained through the credulity, susceptibility, or peculiar situation of their patients or employers. But they are all required to bring to the discharge of their undertakings a degree of learning, skill, and attention equal to the average of the profession to which they profess to belong. No physician can be presumed to have contracted for extraordinary intellect, skill, or attention; but the failure to possess, or to bring into active service in any particular case a reasonable degree of intelligence, skill, and assiduity, would be imputed to a physician by the court as a breach of his obligations in any case in which he is employed."

2. *Relations between physician and patient :—*

"The relation of a physician to his patient or his employer is, in contemplation of law, one of contract, and the contract is either express or implied. The parties can make an express contract, as, for instance, a contract of 'no cure no pay;' or the physician may agree in the first place that he will attend the case and make no charge. The physician would be bound by either of these agreements; in the latter case the consideration on the side of the patient is, that he will submit himself to take the doctor's medicines, conform to his directions, and be treated by him. In all cases of express agreement, whatever be its terms, so they be lawful, both parties are bound by it. . . . Where there is no

special contract, there is an implied obligation upon a physician to bring to the discharge of his professional duties that degree of diligence, attention, learning, and skill which is adequate to the performance of the undertaking; that he shall in no case neglect it; and that he shall treat the case according to the well established usages of his profession; and that he shall not abandon it until recovery or death shall render his services no longer needful, or until he shall have been dismissed by his patient or employer, or by some other person having proper authority to do so. He may, however, withdraw from the case for good cause, and upon giving proper notice, so that another medical attendant can be obtained. If he do this, however, it will not relieve him from responsibility for any previous incompetency or neglect. A physician is not responsible if he exercise ordinary intelligence, skill, and attention, though he may make mistakes or commit errors of judgment, seeing that the liability to do this is inherent in all human beings and in all human affairs."

3. *With regard to compensation, it is stated* that: "If there be a special contract his employer would be bound by it, however exorbitant that compensation may seem, because the law will not interfere with any contract which a sane and free person, who is competent to contract, may make." "All that the law requires is that there shall be no fraud, no misrepresentation, no undue advantage taken." . . . "There is no legal obligation upon a physician, in the first place, to attend every case to which he is called, or to assume, *nolens volens*, every case that offers itself. He is no hotel keeper or common carrier, who must accommodate every comer without choice or discretion. He may exact his own fees, though they may be above the customary charge of the profession in his locality. He may charge one more and another less; he may practise his profession gratuitously; he may refuse such cases as he pleases, and to attend to such as he pleases; but when he does undertake to treat a case, he will be held to the law as I have stated it, in respect to all its duties and responsibilities. If there be no special contract, and no notice to the contrary, having discharged his duties according to the nature and terms of his undertaking, he will be entitled as a compensation for his services to such rates of payment as are customary with the profession in his locality." . . . "In this utilitarian age, the practitioners of both professions are as much entitled to establish a tariff of fees and emoluments, to collect them, and to enforce their payment, as farmers, blacksmiths, or carpenters. And this, instead of lowering professional dignity, has exalted it by adding to the reward which eminence and reputation hold out, those also of comfort and opulence in declining life."

4. *With reference to testimony before courts of law*, he says: "Physicians are sometimes required to appear before courts as witnesses as other citizens are. When thus called to testify about facts within their knowledge, . . . they must attend and give their testimony, subject to the common and ordinary rules applicable to witnesses. But they are liable also to be summoned to testify in cases, the physical facts of which are wholly unknown to them. But these facts being, or regarded as being, unsatisfactory to the tribunal engaged in their investigation, require to be interpreted by scientific skill, a physician is called in and given a statement of the facts, and required upon his oath to elucidate them in the light of his scientific skill and experience. . . . The ability of the physician to serve in the capacity now required, is the result of large expenditure of money, of years of patient study, and other years of laborious experience. The law, therefore, which never does or countenances a wilful wrong or robbery, requires that those who thus seek for learned advice or services, shall be prepared to pay for it according to the accustomed rates of the profession to which the expert belongs." Professor Ordionaux declares: "On the witness stand, *precisely as in his office*, his opinions may be given or withheld at his pleasure, for a skilled witness cannot be compelled to give his opinion, nor committed for contempt if he refuse to do so." Nor can physicians be obliged to make an autopsy, or give an opinion upon it, "until they have been paid for the same, or promise to that effect been received."

The address concludes with a sharp criticism upon the law of Mississippi, which considers ten dollars a sufficient fee for a post-mortem exam-

ination, although it may involve exhuming a dead body from the ground, or "the necessity of an analysis of the contents of a stomach far gone in decomposition."

Dr. B. A. Vaughan contributes short reports upon a number of *New Remedies*: Cascara sagrada for constipation; naphthaline for whooping-cough; pilocarpine in dropsy and in fevers; and dry earth as an application in strangulated femoral hernia, a curious case of which is reported.

In a report upon *The Surgery of Mississippi*, by a number of contributors, some interesting cases are reported. In a very narrow urethral stricture Dr. Daniel, of Jackson, succeeded in passing a small fiddle-string, which expanded in the urethra sufficiently to enable him to insert a small bougie, and to practise rapid dilatation. He therefore recommends catgut fiddle-string as an "entering wedge" in a case of almost impermeable stricture of the urethra. Some interesting gynecological operations are reported by J. M. Greene, M.D., of Aberdeen. Dr. W. Y. Gadbury figures and describes a new appliance for fracture of the lower extremities.

F. W.

ART. XXI.—*Diseases of the Ear in Children*. By ANTON VON TRÖLTSCHE, M.D., Professor in the University of Würzburg. Translated by J. ORNE GREEN, A.M., M.D., Aural Surgeon, Boston City Hospital, from Gerhardt's *Handbuch der Kinderkrankheiten*. 8vo. pp. 165. New York: Wm. Wood & Co., 1882.

It will be difficult for the medical practitioner to find a better guide in the study of the etiology and pathology of aural diseases in children, than is afforded him in this brochure of Dr. Von Tröltsch. The work is divided into five parts or chapters as follows:—

- I. The Diseases of the External Ear, viz., of the Auricle, Meatus, and Drum-membrane.
- II. The Diseases of the Middle Ear, viz., of the Tympanum, Eustachian Tube, and Mastoid Process.
- III. Foreign Bodies in the Ear.
- IV. The Diseases of the Inner Ear or Labyrinth.
- V. Deaf-Mutism.

In the first chapter much information of a practical nature is given, which if acted upon by the reader will enable him to relieve discomfort and pain, and save the hearing of his little patient.

In the second chapter not only directions for relief of pain and deafness are given, but the serious nature of aural disease is pointed out and measures indicated for its avoidance, or for its relief. After careful explanations the author says, p. 58, "It is thus seen that even in the most obscure cases there are a number of points which are of value in establishing a differential diagnosis between acute otitis media and meningitis, and if, in fact as many authors assert, the former is very frequently overlooked or unrecognized, the chief reason is that the existence of "cerebral" symptoms with exudative tympanic inflammation and the frequency of this disease in childhood are not yet sufficiently appreciated by the majority of physicians. Physicians are still too little accustomed to consider the

ear as a very frequent seat of disease, even when there is no complaint of pain or discharge, and still less to regard it as one of the organs which, under pathological conditions, may seriously disturb the whole organism." Hence, further on, the author is emphatically justified in saying "it must become the duty of every qualified practitioner, in a large number of general diseases, especially with children, to inform himself of the condition and powers of the ear, and also to direct the attention of the attendants to this organ without waiting for urgent symptoms to proclaim themselves." The danger in which the ear always is in scarlatina, smallpox, croup, and diphtheria, should never be forgotten, especially as in smallpox 98 per cent. of all cases show simultaneous ear disease, on the authority of so thorough an investigator as Wendt. We further learn that when children have reached the age of one to one and a half years, and utter no sounds such as *mamma* or *papa*, and do not even begin to affix words or sounds to the things with which they are surrounded, we should institute careful investigation to learn the condition of their ears and hearing. The so-called "absence of mind" in older children, or the disagreeable "what say," is often due to a changeable hearing, and is likely to be attended with disease of the naso-pharyngeal mucous membrane. When the author comes to allude to chronic purulent catarrh, and the examination of the ear in that disease, he gives the following caution. "An inexperienced hand should never, in such cases, be led to probe the deeper parts in order to satisfy his impatience, as the sensitive tissues can be easily injured and it is even possible that a softened carious spot may be perforated, and the cochlea or vestibule laid open." But nowhere, perhaps, in the entire book, can the reader find a passage with more important information in it nor one which shows how signally a master of his art, the writer is, than appears on pages 107-113. Here the anatomical relations between the ear, the brain, and the circulation of the temporal bone are set forth most clearly, and the often fatal results of ear disease fully explained. "The general diseases secondary to an otitis arise from the capillary system or from an extension of the inflammation and putrefaction to parts in close relationship to the ear."

As an explanation it must be borne in mind that "from the skin of the meatus and of the mucous peritoneal lining of the middle ear both arterial and venous branches pass into the contiguous bone; in a similar way the capillary system of the petrous bone, with the arteries and the veins, are in direct connection with the dura mater, so that the vessels of the latter are in communication through the capillaries of the bone with the soft parts of the external and middle ear. The bloodvessels of these two regions, the ear and the brain, are also directly connected through the diploëtic veins of the temporal bone which discharge into the sinuses of the dura mater, especially the sinus lateralis and sinus petrosus superior, and also through the *venæ emissariæ* which arising from the sinuses, pass through the bone and discharge their contents into the external veins of the head. From these mutual capillary connections between the endocranium (dura mater), on the one hand, and the pericranium (skin of the mastoid, squamous portion of the temporal bone, meatus, and lining of the middle ear), on the other hand, and from the connections of each of these regions with the capillary system of the temporal bone itself, the reason is evident why pathological processes in the soft parts of the ear may so readily produce softening of the contiguous bony tissues, or lead to secondary processes in the dura mater or its sinuses, or else by extension

along the vena jugularis may cause pathological conditions anywhere within the circulation."

We are further told that if the vena jugularis contains obstructing or putrefactive matter and bacteria, as the result of chronic aural inflammation, these may be carried forward into the lungs or other distant organs and produce well-known embolic or septic disturbances, which express themselves sometimes as metastatic abscesses, sometimes in the form of septic or typhoid fevers, and are finally recognized as infarcts, purulent deposits, and gangrenous inflammations in the various organs and cavities.

In order to get accurate statistics as to the frequency with which tuberculous processes, especially in childhood, are associated with caseous purulent masses in the middle ear and antrum mastoideum, the cavities of the petrous bone which lie just beneath the dura mater, should be examined. If this were done the author thinks, rightly in our opinion, that greater care would hereafter be taken to prevent retention of pus within the ear. It is indeed quite probable that the masses which have been described as tubercles in the drum cavity were only masses of inspissated pus and that the ulceration of the drum-membrane and the otorrhœa did not proceed from these masses as the primary disease, but *vice versa*, the pus formed in the ear from neglect, and drying there was falsely called tubercle. When discussing foreign bodies in the ear the author quotes very aptly the advice of Heister, "Chirurgu mente prius et oculo agat, quam manu armata." Nowhere would this have more force than in the management of foreign bodies in the ear. Be sure there is a foreign body in the ear, see it for yourself, do not endeavour to take out a foreign body from the ear because the patient or his family say that one is in the organ. Then when one is found remember that it had better stay there indefinitely than that rough endeavours should be made to get it out, and this means that by any other hands than the skilled, nothing but syringing should be resorted to, for the removal of the foreign substance, whether animate or inanimate. "It should always be borne in mind in any case of extended neurosis of uncertain origin, and especially in epilepsy that the ear is one of the parts requiring attention and examination."

In the fourth chapter, that on diseases of the inner ear or labyrinth, we are informed that we possess no normal standard of the quantity of otoliths, that it is very rare to find a perfectly normal organ of Corti, that we know more of malformations of the internal ear than of its pathology, and that malformations are often confined to the internal ear and are due to the development of the labyrinth from its own "labyrinth vesicle" in the region of the cerebellum, while the middle ear and meatus are developed from the first branchial fissure, and the ossicles from the two first branchial arches. In only extremely rare cases has a congenital absence of the auditory nerve been observed. The author doubts the existence of a true otitis interna purulenta, for in his opinion an otitis interna purulenta has always been found in conjunction with purulent disease in the tympanum or membranes of the brain.

When alluding to the purulent disease of the ear and consequent deafness found in some cases of cerebro-spinal meningitis, the author very wisely suggests that the ear disease might have been preceded by the careless application of ice.

In those cases of bilateral deafness occurring in the disease known as *otitis labyrinthica* (Voltolini and others), the lesion is pretty clearly shown by the author to be an inflammation in the fourth ventricle on its

floor and lining membrane. The short fifth chapter on deaf-mutism, closes this valuable and interesting work. The translator has done his work perfectly. We cannot praise him too highly for his smooth translation, which is in signal contrast with the clumsy, almost disgraceful English to which some translators are willing to put their names. The publishers should be commended for the extremely handsome form in which they have issued this most readable and instructive brochure. C. H. B.

ART. XXII.—*Atlas of Gynecology and Obstetrics*. Edited by Dr. E. MARTIN, Professor of Gynecology at the University of Berlin, and Dr. J. P. MAYGRIER, Membre de l'Académie Royale de Médecine, Prof. d'Accouchements. Containing 475 plain, and 35 coloured Illustrations, from the original designs of Beigel, Virchow, Hyrtl, Coste, Schroeder, Spiegelberg, Vrolik, Duges, Hodge, Duncan, Moreau, Kussmaul, and 80 others. *The Explanatory Text Translated and Edited, with Additions*, by WM. A. ROTHACKER, M.D., Pathologist to the Cincinnati Hospital. Folio. Cincinnati, Ohio: A. E. Wilde & Co.

THIS large atlas is composed of 59 folio plates, with an explanatory page opposite each, the size of the leaves being 17 by 22 inches. Since the day when Maygrier's large work was published we have not had a set of obstetrical illustrations equal as a whole to the collection here presented. The original work of Moreau was, in some respects, more attractive by reason of the colouring of all the plates contained in it, but this adds more to the expense than the real value of the illustrations.

The work under review is a compilation mainly from two well-known atlases, viz., Martin's "*Hand-Atlas der Gynæcologie und Geburtshülfe*," and J. P. Maygrier's "*Nouvelles Demonstrations d'Accouchements*," with some additional plates selected by the American editor.

We recognize in this collection many very familiar pictures; in fact, there are very few that we have not seen before. The plates taken from Maygrier are, upon the whole, the most effective, though some of the coloured designs from Martin present the most beautiful appearance. The frozen sections, and many of the smaller figures, have too much of a nebulous character, and would have looked better if they had been more sharply drawn. The work could still be improved by a few additions. We should like to have seen a good picture to illustrate Porro's operation; a copy of Chiara's frozen section, showing an actual spontaneous evolution in progress at the time of death, etc.

The size of this work, and the effective character of many of its obstetrical plates, will make it of much value to teachers of medical students, to practitioners of midwifery, and to medical libraries in general. In many of the plates, the illustrations are quite equal in execution to the originals, and the book as a whole does credit to its editor and publishers.

R. P. H.

ART. XXIII.—*On the Treatment of Cancer.* By JOHN CLAY. 8vo. pp. 35. London: J. & A. Churchill, 1882.

IN the *Lancet* for March 27, 1880, Mr. Clay published a remarkable paper "On the Treatment of Cancer of the Female Generative Organs by a New Method"—Chian Turpentine—in which he asserted that the disease disappeared within a period of four or five weeks up to as many months, and the patient finally recovered. Coming from such a source the statement naturally aroused instant attention, and in the *Lancet* and many other journals one communication after another on the subject have appeared, and Mr. Clay was besieged, both with samples of the turpentine—of which he received over three hundred,—on the genuineness of which he was expected to pass an opinion, and with many requests for his papers. Accordingly he has reprinted his three communications in the present pamphlet.

But it is like summoning a ghost that has been laid. Chian turpentine, like cundurango—of ill odour—has had its day. It is dead, like Marley, "dead as a door-nail."

Prof. Clay has claimed that the drug was not genuine: that it was not given properly; that it did not digest; that it was not given for a period long enough to test its virtues; that the cases were ill selected, and too far gone; that prejudice interfered with its success, and finally,—*mirabile dictu!*—that he never said it would "cure" cancer. But any one who will read these three papers, and then, in spite of the want of exact and detailed histories, such as we always wish, and especially as to any new remedy, and when the cases are few, who will rise from the reading with any other idea than that Mr. Clay means that Chian turpentine will cure cancer does not know how to interpret ordinary English. In fact, he uses the word "cured," and its synonyms "disappear," "remove," "melt away," etc.

But were anything wanting, the published cases of Mr. J. W. Hulke and Mr. Henry Morris, of the Middlesex Hospital, would have given the Chian turpentine treatment the *coup de grace*. This hospital has a special ward founded, in 1792, for all cancer cases; they are admitted even without a governor's certificate; and once there, are entitled to stay on the cancer foundation, as it is quaintly expressed, "till they are relieved by art, or released by death." The surgeons are obliged to keep a record of each case, to try every reputed remedy that will not do harm, and to publish the results. They tried Chian turpentine, and it seems to us faithfully and fairly; it failed. They published the results of a larger number of cases, and much more in detail, than Mr. Clay has done, and the result is, that the purchase and further trial of the drug has been stopped by the Governing Committee. Mr. Clay's colleagues and *confrères* in Birmingham might be accused of jealousy, and of rivalry, but their united voice is in the same direction, and vigorously so. In fact, the chorus of "noes" all over the world drowns the few "ayes." "The noes have it," is the result of the appeal to the profession. W. W. K.

ART. XXIV.—*A Study of the Tumours of the Bladder.* By ALEX. W. STEIN, M.D. 8vo. pp. xii., 94. New York: Wm. Wood & Co., 1881.

DR. STEIN has done an important service to the profession in giving us the best, and in fact the only, monograph on this subject. It is clear, concise, not too much encumbered with details, and, though taking up both the theoretical as well as the practical side of the question, is not dry or dull. As the subject is so new, at least in its present aspect, both as to diagnosis and especially as to treatment, we only regret that he did not give, in an appendix, either a brief *résumé* or a full report of all the cases thus far recorded. He has done, however, the next best thing, and one which adds less to the bulk and the cost of the book, by prefacing it with a complete and chronologically arranged bibliography, beginning with Warner's case, in 1747, recorded in the *Philosophical Transactions* for 1790, the earlier volumes of which, by the way, contain many rare and valuable medical papers. It is curious to see how few American cases there are. There are about 150 or more cases given, but only 10 of them are from this country, the earliest being that of Theinemann in the *American Journal of the Medical Sciences* for July, 1845. Stein's two cases are given in full as is proper, together with microscopic drawings.

The diagnosis of such tumours is by no means easy; but if the surgeon will investigate patiently he will be able usually to reach a fairly certain conclusion. The urine and the eye of the catheter should both be examined with care for little detached fragments, for these will throw far more light on the disease than the examination of the urine itself, which is usually negative. Sometimes, indeed, quite large fragments are detached and expelled, and even the entire mass may thus be got rid of. In the female, owing to the wide and short urethra, the tumour, especially if papillomatous in structure, may protrude from the urethra. Their very position, which is rarely at the fundus, favours such a happy aid to diagnosis. The dilatation of the urethra in women, both for diagnosis and treatment, is always a ready means. The author is in favour of it, of course, and figures an ingenious instrument for this purpose, which also answers as a speculum. The bimanual examination is in most cases essential, and sometimes the entire hand may be introduced into the rectum.

In using the bimanual examination, Dr. Stein recommends that that hand which is placed on the belly-wall should be pressed down by the hand of an assistant, a very useful hint in many cases. The exploring catheter he recommends to be a short beaked one, as it has greater freedom of movement, and that external pressure on the bladder be used at the same time. As to treatment, the *ultima thule* of all pathology and diagnosis, he recognizes that but little can be done of a palliative character.

It is chiefly by operation that the patients must be relieved. Indeed, in the very earliest recorded case (Warner's) the patient, a woman, was thus relieved. One of the most valuable parts of the "study" is the *résumé* of all the operations heretofore attempted in chronological order; first those performed on women, then those upon men. In women the operation is, of course, by far the most frequently done per urethram; but in case of need through the vesico-vaginal septum. Up to 1871 only four operations had been done in the male. Since then seven have been performed, a short account of each being given. Up to 1874 perineal cystotomy had been the only operation save one operation by Civiale by means of the trilabe.

Billroth first did supra-pubic cystotomy on finding that the perineal operation would not answer, on account of the size of the tumour, a method also adopted by Volkmann in the same year. The first patient recovered, the second died. In the same year Kocher removed a papilloma by a scoop through a 1 incision in the perineum. In 1877 and in 1880, Humphry and Davies Colley by the lateral operation for stone reached and removed two tumours; the first by the finger-nail and forceps, the latter by the scissors. All these cases recovered. In 1880 Marcacci did a supra-pubic cystotomy, and removed a very large tumour. He closed the vesical wound by four catgut sutures, which, however, seemed to give way too early, when extravasation of urine occurred, and the patient died, worn out, in two months.

In all, 34 operations have been done; 23 in females and 11 in males. In 17 of the former operations the access was by the dilated urethra. In 6 by incision of the urethra or through the septum. Of the 17, ten recovered; of the 6, three. Of the 11 operations on males, eight were by the perineum, two by the perineum and above the pubes together, and one by supra-pubic cystotomy alone. Of the 11 six recovered. The apparently large death-rate in the operations in the male is explained, to a great extent, by the peculiar histories, and in ordinary cases much better results may be expected hereafter. In epi-cystotomy he calls attention to T. G. Thomas's recent case of ovariectomy, in which the bladder had to be opened, and the vesical wound was closed by the sutures used for uniting the abdominal wound, the vesical walls being interposed between the lips of the abdominal wound.

Dr. Stein is a strong advocate for an early operation even in the absence of severe secondary symptoms, on the ground that if no operation be done the case can only go from bad to worse. Indeed, he justly believes that if there be strong evidence in favour of a vesical tumour, and the catarrh and the consequent suffering be severe, an operation of exploration is justifiable; for, if a removable tumour exist, it may be extirpated, or if it be a hopeless case, or if no growth exist, the cystotomy will give ample temporary relief.

We have given comparatively large space to a small book, but it is one of the books that deserve it.

W. W. K.

ART. XXV.—*Health Reports.*

1. *Fourth Annual Report of the State Board of Health of the State of Rhode Island for the year ending December 31, 1881.* Providence, 1882. pp. 350.
2. *First Biennial Report of the State Board of Health of the State of Iowa for the fiscal year ending September 30, 1881.* Des Moines, 1882. pp. 346.

1. ACCORDING to the preliminary report of the Secretary the average health of *Rhode Island* has exhibited no great departure from the circumstances which usually prevail. The most remarkable of the special forms of disease which displayed unusual virulence and frequency, has been malarial fever, which, as we have already previously noticed, seems to be

resistlessly spreading over Connecticut and Massachusetts also, in a manner curiously suggestive of a gradual dissemination of some organized *materies morbi*. Diphtheria, which had declined in frequency during 1879 and 1880, was again rife, but neither it nor scarlet fever attained to epidemic prevalence except over limited areas and for short periods of time during the year.

The first 216 pages are occupied with the report of the Secretary Charles H. Fisher, M.D., of Providence. This lengthy document is chiefly statistical, and represents in a condensed form, an immense amount of faithful labour in collecting and arranging the multitudinous details respecting births, marriages, and deaths throughout the State. His diagrams illustrating the relative birth and death-rate in different counties and towns, are very clear and satisfactory.

Dr. C. V. Chapin, of Providence, contributes an essay on *Malaria in Rhode Island*, from which it appears that this disease approached from the valley of the Hudson in the neighbouring State of New York, and broke out among some brickmakers in 1880. From the swampy locality where they worked it spread to Providence and to fourteen other towns. No summary of the whole number of cases is furnished, and the author's observations only confirm the doctrine that there is a distinct and specific malarial poison which produces an "immense majority" of the cases in the immediate vicinity of low wet regions.

Parental Education is the subject of a thoughtful paper by Dr. Franklin C. Clark, of Providence, in which the author considers the important subjects of congenital heredity, having for its office the fixation of types, and of acquired heredity through the influence of which alteration of types is accomplished. Dr. Clark concludes that a proper understanding of the law of heredity leads to the proper variety of *prenatal* education to be adopted, and careful attention of this kind to the mother during gestation is followed by the happiest results, although the creation of tendencies or predispositions is all that in the present state of science can be expected.

The most important and timely article in the book is one on *House Drainage and Sanitary Plumbing*, by Wm. Paul Gerhard, Civil and Sanitary Engineer, Newport, R. I., which is worthy of a far wider circulation than it will obtain in this volume. The writer's purpose is, without in any way adding to the "plumbing scare," clearly to define wherein the danger from sewer gas, or more properly sewer air, consists, and to establish rules for the proper drainage and plumbing of houses which may be relied upon as positively safe. Without claiming any special originality in his work, Mr. Gerhard contends that whether the germs of filth diseases are particles of "organic vapour," or microscopic spores, the danger of infection arising from defective drainage and plumbing may be reduced to a minimum, "by completely removing as speedily as possible all waste matters from the dwelling, by pipes thoroughly and tightly jointed, and by a sufficient dilution of the air in these pipes with oxygen." Our author first considers drains outside of the house, and declares that these should be of earthenware pipe from 4 to 6 inches in diameter, with a fall of 1 foot in 60, laid not less than three feet below the surface, and with well cemented joints. For drains inside the house he urges coal-tarred or enamelled iron pipe (in preference to lead) with perfect joints, to be carefully tested by hydrostatic pressure, or by oil of peppermint. With these preliminary conditions he maintains that the essential elements of a safe system of plumbing are:—

“1st. Extension of all soil and waste pipes through and above the roof. 2. Providing a fresh air inlet in the drain at the foot of the soil and waste pipe system. 3. Trapping the main drain outside of the fresh air inlet, in order entirely to exclude the sewer air from the house. 4. Providing each fixture as near as possible to it with a suitable trap. 5. Providing vent pipes to such water-seal traps under fixtures, as are liable to be emptied by siphonage.”

The details of methods for accomplishing these important desiderata are fully explained and illustrated at a length which want of space forbids us to imitate here, but we would recommend the essay in its entirety to every householder who is anxious to escape those most dangerous of all common causes of disease, the emanations from waste pipes and sewers.

2. The report from *Iowa*, being the first of what we hope may prove a long and useful series of sanitary documents, appropriately opens with the Secretary's account of the legislation creating the State Board of Health, the organization of the central and local boards, etc. etc. As usual, there seems to have been many obstacles, arising from popular ignorance and prejudice, to overcome, but through the judicious systematic efforts of the Board towards popular instruction in sanitary matters, by circulars, hygienic lectures, and similar means, we may fairly anticipate the best results in consequence of an enlightened public opinion in regard to care of the public health.

The first essay of the volume, on *Water Supply and its Relation to Health and Disease*, by Dr. W. H. Dickinson, is a clear and judicious exposition of its important subject, and conveys exactly the right kind of information in regard to the dangers of polluted drinking fluids, and the precautions needful for securing pure water. Dr. Dickinson follows Dr. H. B. Baker, Secretary of the Michigan Health Board, in recommending Heisch's test with sugar, as a simple household method for detecting the contamination of drinking water by sewage (p. 216).

The report on *Slaughter Houses*, by P. W. Lewellen, M.D., contains some good suggestions, especially one in regard to a butcher's refrigerator, but is imperfect for want of data, which should have been furnished by local health officers.

L. F. Andrews, of Des Moines, the Secretary of the Board, contributes a paper upon *Glanders in Man and Domestic Animals*. Without claiming any special veterinary skill, or presenting any new facts in regard to this horrible disease, which appears to have been alarmingly prevalent in Iowa, Mr. Andrews has prepared an excellent compilation of our knowledge respecting glanders, which is well calculated to accomplish its praiseworthy object of diffusing information conducive towards preventing a further spread of the disease.

Adulteration of Food, by Dr. R. J. Farquharson, is another useful compilation, giving the recent results of investigations as to the purity of sugar, flour, tea, coffee, butter, etc., made under the auspices of the National Board of Health, and of the Massachusetts and Michigan State Boards.

Short articles on the *Diseases of Domestic Animals and their Relation to the Health of Man*, by Prof. M. Stalker, V. S.; on *Sewerage, Drainage, and Disposal of Excreta*, by James L. Loring, C. E.; and on *Smallpox Hospitals*, by Dr. Farquharson, make up the remainder of the book.

J. G. R.

ART. XXVI.—*Bibliothèque Diabolique.—Le Sabbat des Sorciers.* PAR BOURNEVILLE ET E. TEINTURIER. 8vo. pp. 38. Paris: aux Bureaux du Progrès Médical, 1882.

APPARENTLY our contemporaries of the Progrès Médical propose to issue a series of *brochures*, illustrative of some of the superstitions which are usually regarded as forgotten, but which have much more currency among the uneducated than is supposed by those who do not realize how ineradicable are beliefs that have once obtained possession of the human mind. As its title indicates, the present pamphlet is devoted to the nocturnal feasts which witches were believed to celebrate under the presidency of Satan, and it consists of extracts from the works of demonographers which were regarded as authoritative in the sixteenth and seventeenth centuries, illustrated by numerous fac-similes of wood-cuts representing the various phases of intercourse between demons and their votaries. These details, for the most part, were obtained from the confessions of the poor wretches who were examined under torture and convicted of the unpardonable crime of sorcery, and it would be a most interesting inquiry to determine how much of their stories was the result of a desire to escape from torment by satisfying their judges, and how much was simple hysterical monomania. Unfortunately the editors have not deemed it a part of their duty to investigate this, beyond a short note on p. 25, calling attention to the possible connection between the odour popularly attributed to witches and that which is recognized as exhaled by patients in attacks of hystero-epilepsy. We trust that in future issues of the series more attention will be paid to this subject, for few more interesting contributions to the history of human error could be made than an examination into mediæval demonology by the light of modern scientific knowledge of mental aberrations and nervous disease.

H. C. L.

ART. XXVII.—*Die Pflege und Ernährung des Kindes*, von Dr. A. JACOBI, Prof. der Kinderheilkunde am College of Physicians and Surgeons, zu New York. Separat-Abdruck aus Gerhardt's Handbuch der Kinderkrankheiten. H. Laupp. Tübingen (2te Auflage 1882) S. 173.

The Care and Nourishing of the Child. By Dr. A. JACOBI, Prof. of Diseases of Children in the College of Physicians and Surgeons, New York. Reprinted from Gerhardt's Handbook of Children's Diseases. Tübingen.

THIS contribution of Prof. Jacobi's to Gerhardt's magnificent encyclopædia of our knowledge in regard to the diseases of children has been separately printed, and would be well worthy of immediate translation entire into our language.

It appropriately opens with some general considerations in regard to the various causes which increase the death-rate among children, and our author then proceeds to consider the methods of establishing respiration and circulation in the feeble new-born infant, the care of the cord and

navel, the examination for deformities, paralysis, tumours, etc., all of which are ably and exhaustively discussed.

The next section includes advice in regard to the temperature and duration of the child's bath, and the management of the baby's breasts in which the avoidance of the rude pressing and squeezing so often practised by nurses is judiciously insisted on. The important question—whether the child should be put to the breast at once—is decided in the affirmative, on the ground that we can thus best avoid the temporary emaciation which otherwise occurs, and so imitate the tendency to gain in weight observed from almost the first day in the lower animals.

In no portion of the work is the sound judgment and profound learning of our author more conspicuously displayed than in his chapter upon nursing infants, which includes the great subjects of the period of weaning, the interference of menstruation and pregnancy with lactation, the selection of a wet-nurse, and the special treatment of this sometimes necessary evil.

On page 72 commences the very important section in regard to the substitution for mother's milk, first, of that of different animals, and further on of various farinaceous and other compounds. Prof. Jacobi's experience with goat's milk is not favourable, and as mare's milk and ass's milk are seldom employed on account of their scarcity, the most available substitute is of course cow's milk. Our author gives some curious observations by Renaud, Bernard, and others on the value of slut's milk in cases of rachitis, in which the results were very favourable (vide p. 86). Among the other substitutes is mentioned the egg drink of Hennig (p. 96) which, however, does not receive the earnest commendation bestowed upon it by Dr. Jacobi in Buck's "Hygiene," where he declares that he has saved many a baby's life by the use of a slightly modified form made with barley water.

The momentous questions in regard to vegetable substitutes for breast milk are introduced by a most instructive disquisition upon the action of the infantile salivary glands, pancreas, liver, and intestines upon the constituents of the farinaceous aliments, which involves an exhaustive consideration of the causes of costiveness in babies, and admirable rules for its dietetic cure. Much of the information contained in this chapter may be found in our author's excellent article on Infant Hygiene, already reviewed in these pages (Buck's "Hygiene and Public Health," vol. i. p. 106 *et seq.*); in Dr. Jacobi's useful little book on "Infant Diet;" and in his eloquent address, as President of the New York State Medical Society, upon "Infant Foods and Infant Feeding," where, however, the sound microscopical investigations of Eliza McDonough are unfortunately associated with pseudo-scientific observations upon so-called gluten cells.

Six pages of "Aphorismen," giving the contents of the work in an abbreviated form, on pp. 154–160, serve the purpose of an index and table of contents, while at the same time they afford a concise yet complete exposition of the author's teachings. Their value is so great that we would direct particular attention to them, especially as on account of their position in the book, they might otherwise escape observation in a cursory perusal.

The work concludes with three brief sections, in the form of appendices, on the care of the teeth, the care of the senses, and the care of the soul. In the last of these chapters our theological readers will, however (except they be priests and priestesses of agnosticism), find but little aid or comfort, since the second sentence runs as follows: "Den Gehalt an Fett und Phosphor bedingen zu einem hohen Grade die Quantität der Hirnarbeit."

We feel that our brother practitioners, to whom a work in the German language happens to be a sealed book, have reason to rejoice that most (though unfortunately not all) of this invaluable contribution to medical science has already a place in our standard American literature, and we heartily congratulate its gifted and accomplished author on that comparatively rare mastery of two distinct tongues which enables him to inculcate his teachings upon such a most important subject with equal facility to both the leading nations of the civilized world.

J. G. R.

ART. XXVIII.—*Inoculation of Leprosy upon Animals.* (*Separatdruck aus Virchow's Archiv*, 1882, Band 88.)

PROFESSOR HEINRICH KÖBNER, of Berlin, gives in this reprint an account of his attempts to inoculate various animals with leprosy. The material employed was from a German who had acquired the disease after a residence of eleven years in Pernambuco. It first exhibited itself in its macular, anæsthetic form, to which subsequently tubercles were added. On the twelfth of April, 1881, one of these nodules was cut out from the patient's thigh, and examined with the assistance of Dr. Koch, who also aided the author in the subsequent experiments. Considering the notions which prevail in leprous countries, that the disease is in some way connected with a fish diet, it was determined to make the trial upon fishes as well as upon representatives of the other vertebrate classes. The tissues and juices of the nodule, having been properly examined and found to contain the expected bacilli, were transplanted upon and inoculated into the following animals: 1. A medium-sized ape from Java, in the subcutaneous cellular tissue of the back, in the skin of both ears, of both upper eyelids, and the mucous membrane of the under lip; 2. Two Guinea pigs, subcutaneously at the bottom of the ears; 3. Three white rats and mice, subcutaneous transplantation in the groin and back; 4. Two rabbits, transplantation of a portion of the nodule into the anterior chamber of the eyes; 5. A pigeon, subcutaneously in the neck; 6. Three eels (*Anguilla vulgaris*), transplantation into the skin of the neck; 7. A mudfish (*Cobitis*), into the muscles of the back; and 8. A frog, into the dorsal lymph-sac.

The frog died April 25th, and on May 23d one of the eels, without exhibiting any bacilli in the blood or tissue. One of the rabbits died on June 7th of pneumonia, the other was killed Sept. 30th. In neither was any leprous matter or free bacilli. The rats, mice, and the dove were killed after months with the same result. The Guinea pigs, after two successive pregnancies, as well as their young, were found to be free from any signs of leprosy or bacilli, and an examination of the tissues at the points of inoculation showed doubtful vestiges of the foreign material encapsuled, but no bacilli. The fishes exhibited after two or three months an affection of the skin of a parasitic nature, in which bacilli were found, but not those characteristics of leprosy, and with which they are frequently affected, both in their ocean life, and the aquarium. The ape exhibited on July 15th a brown, nodular swelling on the upper lip, which increased so much in resemblance to a leprous nodule that at the

time of its death, August 18th, under symptoms of hectic fever and dyspnoea, it was regarded by those familiar with the appearances of leprosy as evidence of a successful inoculation. Examination showed, however, that the animal died of general tuberculous disease, and that neither the blood, the tissues, the seats of the inoculation, nor the nodular swelling upon the lip contained bacilli. Moreover, inoculation with the tubercular matter produced miliary tuberculosis in two Guinea pigs after six weeks. Thus in none of the animals was general or local leprosy produced by this series of inoculations.

An examination of the eyes of the rabbits, one on the fifty-sixth day, one in five and a half months after inoculation, gave the interesting results that the minute portions of leprosy tissue implanted at that time were found in a slightly shrunken condition near the scleral edge of the cornea. They contained as at first the bacilli in a complete state of preservation, but with no new development, and with no migration into the tissues of the iris or cornea. So unchanged were they that the author would regard the aqueous humour as the best preserving medium for the contents of lepra cells. This result in Köbner's opinion throws doubt upon Neisser's conclusion, that finding bacilli a short time after inoculation at the point of insertion is proof of new development of bacteria or of the reproduction of local leprosy upon animals. The durability of these growths is further shown by the author in the recent examination of two old specimens. The first, received by him nine years previously and preserved in weak alcohol, consisted of large leprosy nodules from the trachea and skin. Two years ago he examined them by methods of treatment then employed, but failed to find any evidence of bacilli. Recently, after hardening for several weeks in 96 per cent. alcohol, then treating the sections with somewhat concentrated acetic acid, afterwards with a 5-10 per cent. potash solution, then with a one per cent. aqueous "gentiana-violett" solution, and finally washing in alcohol, by oil of clove and balsam, an abundance of bacilli became evident both in the portion of tissue previously coloured and in those previously untouched. The staff-like bodies were found at the edges of the vacuoles, which he with Neisser regards as degenerated masses of bacilli, in the small infiltrated cells, and free in the connective tissue. The second specimen was a dried leprosy nodule, removed by him nineteen years previously in Norway, and kept wrapped in paper since then. After the above treatment the bacilli were found so sharply defined that the author is inclined to consider the drying process as the most useful method of preserving material for examination. Köbner calls attention in his detailed account of the appearances of these growths, which agree with those of Neisser, and Cornil and Souchard, to the important fact that the leprosy cells and bacilli never penetrate the epidermal layer from below upwards, so that the rete always forms a sharply-defined boundary line in the cutaneous nodule; in other words, a protection against inoculation while unbroken. As an open source of contagion, on the other hand, he regards the pus and granulations of leprosy ulcers. The wound made during the excision of the nodule from his patient for the above experiments became excoriated in the bath after six months, and the granulation tissue, and pus removed from this exhibited, when properly treated, abundant bacilli.

Examination of the blood, taken from young and old nodules upon the patient, when fresh, gave no result, but when the cover glass with the dried blood was heated, then coloured and washed in alcohol after Ehrlich's

method, slender bacilli were found in the protoplasm of the white corpuscles, and also in the serum. This constant occurrence of the same bacillus in all the tissues affected by leprosy warrants, in the author's opinion, the conclusion that it is specific, and most probably its cause. That the disease affects healthy settlers in leprous regions, and its endemic limitation to certain districts, as in Norway and Italy, are indications that a specific cause is to be sought for. Proofs of its parasitic character are, however, yet to be obtained, although negative results of inoculation upon animals as the above are in no way conclusive. Perhaps had the ape lived longer the result would have been very different. In view of the newly-collected evidence concerning its contagiousness, he considers the isolation of the leper by confinement the best means of overcoming leprosy as an endemic disease.

J. C. W.

ART. XXIX.—*Lectures on the Pathology and Treatment of Lateral and other Forms of Curvature of the Spine.* By WILLIAM ADAMS, F.R.C.S., Surgeon to the Great Northern General Hospital, etc. etc. Second edition, pp. 302. London: J. & A. Churchill, 1882.

MR. ADAMS has long taken rank among the best teachers of orthopædic surgery. His works bear the impress of patient research, with a large and varied experience. These lectures were originally delivered in 1860–61, now twenty years since, and were first published in 1864. The work was justly regarded at the time of its issue as the most complete treatise on that subject extant. The present edition is a careful revision of the previous edition, with an addition of the views of recent authors in a few notes and a short appendix. It is only the notes and appended matters, therefore, that we need to notice.

The muscular theory of the causation of rotation of the spine advanced by Dods, and maintained by Barwell, is discarded, and the mechanical theory of Shaw advocated. Judson added to Shaw's explanation, the action of the muscular and fibrous attachments of the spinous processes, which tend to maintain these portions of the vertebræ in the median line, while the bodies, being unsupported, deviate to the right or left under the vertical pressure, which is the direct cause of lateral curvature. It follows that while the posterior portions were held in the median plane by the muscular and fibrous attachments, the bodies of the vertebræ fall away from the median line to the right or left. This additional explanation is approved by the author.

In discussing methods of treatment the author enters upon debatable ground of great interest to American surgeons. The question of the value of the recently adopted plaster jacket of Dr. Sayre is considered, and judgment is given adverse to its employment in any form of lateral curvature. The author remarks on cases where there is slight structural changes: "The plaster-of-Paris jacket, embodying, as it does, the principle of immobility, is inapplicable to these cases." He favours combining mechanical support, gymnastic exercises, and partial recumbency. The mechanical support recommended is in the form of the steel spinal instrument with spring plates.

In confirmed structural curves the author also rejects the plaster jacket,

“which, by its constant application, tends to weaken the spinal muscles, and hinders the use of gymnastic exercises.” He prefers, in these cases, mechanical support of a kind that is elastic, and may be removed at night. The poro-plaster jacket is mentioned favourably.

We believe Mr. Adams but reflects the opinions of surgeons who have had much experience in the treatment of lateral curvature in giving his preference in treatment to elastic rather than immobile appliances, and in laying great stress upon the fact that these appliances are in no sense curative. Physiological methods of cure must ever be uppermost in the mind of both surgeon and patient.

The mechanical execution of the work is excellent. This edition has an addition of eleven well-executed new wood-cuts. S. S.

ART. XXX.—*A Manual of Dental Surgery and Pathology.* By ALFRED COLEMAN, L.R.C.P., F.R.C.S., Senior Dental Surgeon and Lecturer on Dental Surgery to St. Bartholomew's Hospital and Dental Hospital of London, etc. Thoroughly revised and adapted to the use of American Students and Practitioners by THOMAS C. STELLWAGEN, M.A., M.D., D.D.S., Professor of Physiology in the Philadelphia Dental College. 8vo. pp. 408. Philadelphia: Henry C. Lea's Son & Co., 1882.

THE specialty of dentistry has made wondrous strides within the last quarter of a century, and this book by Professor Coleman well testifies to that fact. Coming from a gentleman so thoroughly educated professionally, and as the result of his large practical experience, it is instructive to the dental specialist, and ought to command the earnest attention of the general practitioner, who could not fail to be interested, at least, by a perusal of its pages.

The book is a plain, concise and honest instructor and guide, and is written by an earnest worker. It has been thoroughly revised and adapted to the use of the American student and practitioner by Professor Stellwagen, the American editor, who has added some excellent notes and two chapters (VII.—XII.) on instruments and fitting artificial crowns to roots of natural teeth, making about one hundred additional pages, illustrated by some three hundred and twenty instruments, all of which has increased the practical value of the book. D. H. G.

ART. XXXI.—*Practical Medical Anatomy.* By AMBROSE L. RANNEY, M.D. 8vo. pp. xxii., 339; Fig. 156. New York: Wm. Wood & Co., 1882.

AFTER a number of other titles which Dr. Ranney appends to his name, he adds those of three works of which he is the author, but judiciously veils a fourth, the “Anatomical Plates,” which we reviewed in our num-

ber for July, 1881, under an "etc. etc." Just why, in common with so many writers, he puts two "etc.'s," in view of the fact that *et cetera* is already plural, we can hardly see.

The present book, we are glad to say, we can commend. Not but that it has faults, as what book has not? but its virtues outweigh them by far. We are glad, in part, that it is issued as one of Wood's monthly cheap library series, which has presumably a large distribution, for the book will do good, and will revive and freshen the anatomy of many a man who has scarcely gone over it since his graduation a score or two of years ago. And it will be all the more refreshing because Dr. Ranney has utilized and commended the method which we have advocated on repeated occasions as the best way to teach anatomy, viz., by applying it on the living model. This method, though occasionally used by Bell and others, has only lately made any headway as a systematic means of illustration. Thanks to Mr. Holden who, in his "Landmarks," first published anything comprehensive on the subject, and, to some extent, to Hilton, Heath, Sibson, and other teachers and writers, it is becoming more and more popular. We fail, however, to find good evidence for Dr. Ranney's statement that "the anatomy of the living subject was taught in those days [*i. e.*, the days of the 'earlier writers,'] in all its practical bearings in connection with dissection."

The book does not take up the whole body, but only the head, neck, trunk, and viscera. Under each division it deals with the bones, vessels, viscera, special regions, etc., with their clinical anatomy. Holden is reproduced to a very large extent, as indeed any one writing on this subject must always do, but many other authors are laid under tribute. Dr. Ranney has evidently been a wide reader, and has used his reading to advantage. His own additions have been in general judicious and clear, and the arrangement is good. The chapter on the Face in Health and Disease, and its value as a guide in diagnosis, is the most novel, though it is an old journal friend.

The critic who does not criticize is perhaps regarded as untrue to his vocation. We must, therefore, point out a few amendments by which a second edition (for we have no doubt that it will be one of the three per hundred so happy as to reach that distinction) will be improved.

In the chapter just quoted Dr. Ranney is right in saying that the diagnostic value of the facial wrinkles in disease is greater in children than in adults, in whose faces, independently of disease, time has written its record in manifold lines. One partial exception should be made. The transverse rugæ figured in the face of a robust baby very rarely appear in healthy children before six years of age, and often not till eleven or twelve. They appear sometimes in disease, but not often, except in some wizen-faced woe-begone little ones seen in our almshouses and such like places. We can scarcely believe the fanciful indications as to disease which Dr. Ranney assigns to the facial wrinkles. That the transverse rugæ indicate pain "from causes outside the cavities of the body," or the vertical lines pain "from some internal cause;" or that the nasal line if its upper half be strongly developed indicates intestinal, and its lower half gastric disease, or together with the oculo-zygomatic line under the eye, "is a positive indication of worms in children," *credat judæus Apella, non ego*. Indeed, we notice that Dr. Ranney himself always says: "It is thought that," "it is said that," "it is claimed by Peiper that," etc.

Nearly all the plates are atrociously bad, as is the case, in fact, with those

in all the books of the series in which it appears. The excuse, of course, is a reasonable one, that for a dollar you get a 350 page book, with 150 cuts, and fair paper and binding; but a reasonable excuse does not alter a fact. Thus in Fig. 82, the soft palate and tonsils, we would give a copy of the book to any one who could find the tonsils; Fig. 106 is supposed to represent the prevertebral muscles, and Fig. 40 a face after hemorrhage; Fig. 46 gives the visage following obstruction at the pyloric orifice, though why the pyloric rather than any other orifice of the body we fail to see; Fig. 18 represents the "linea collateralis nasi," which, "it is thought, is a reliable guide to diseases of the thoracic and abdominal viscera," and we can well believe that a boy with a face like that might have not only the thoracic and abdominal, but all his other viscera diseased, and mortally so at that. If the visceral disease did not kill him, this cut, if a veritable likeness, would give him good excuse for committing *hari-kari*.

The method recommended for ligation of the lingual artery, on p. 73, is far more difficult than that by the incision above and parallel to the hyoid in the triangle bounded by the hypoglossal nerve above and the two bellies of the digastric in V below, where it lies under the hypo-glossus muscle. We had marked other slight points to which to call attention, but our limits are already exceeded. In spite of minor faults, books like this are good, and will do good. We wish it all success in its mission of educating and improving those members of the profession whose want of leisure and opportunity forbid the study of anatomy practically. W. W. K.

ART. XXXII.—*Rupture of the Spleen medico-legally considered.* By DR. PELLEREAU. *With a review of the subject.* By PROF. ANGIOLO FILIPPI. *Lo Sperimentale*, June, 1882.

IN certain hot countries of the globe, where paludal hypertrophy of the spleen is prevalent, it is not uncommon to find cases of sudden death in which an autopsy demonstrates the fact that the spleen has been ruptured, either spontaneously, or by some act of violence, as a kick or blow, or by accidental application of some sudden force.

The observations of Dr. Pellereau were made in the Isle of France, where in a little more than two years he met with thirteen cases, four of which were spontaneous. The symptoms of the condition are those of a more or less violent collapse. The patient, or victim of violence, feels a more or less acute pain in the left hypochondrium which is subject to exacerbations, due it is thought to extensions in the laceration. Death is due to internal hemorrhage, and the pallor and general symptoms of the subject are indicative of this condition. The fatal termination may occur in a few minutes or not for two or three days.

The necroscopic appearances are pallor of the skin and of the mucous membranes, a swollen abdomen, a diminution in the capacity of the pleural cavity, shown by the forcing up of the diaphragm; in the abdominal cavity are found coagula of blood, with sero-sanguinolent fluid, particularly in the left hypochondrium and corresponding iliac fossa. The spleen may be softened or diffuent and so broken down as to resemble a mass of extravasated blood. The capsule is seldom opaque, as rupture is rare when

it is hypertrophied and cartilaginous as the result of perisplenitis. The spleen is sometimes found adherent to the diaphragm, to the abdominal parietes, or the left lobe of the liver. The parenchyma is of various colours and always softened, because this is indispensable if a rupture is to result from a moderate injury. The softening may be partial and local. The microscope may discover an atrophy of the Malpighian corpuscles.

“*The predisposing conditions* are: 1, a thin capsule; 2, a softened parenchyma; and 3, atrophy and alteration of the constituent elements.”

If the capsule is hypertrophied, and the parenchyma enlarged and indurated, rupture will not take place except under a violent crushing force.

The rupture may be single or multiple, and located on the convex or concave surfaces. or it may be *longitudinal, circular, triangular, stellate, or irregular*. The lacerations may be like a sharp cut, or rough edged, or dentate, but will always be found covered with a little coagulated blood.

Of the thirteen cases all were in males, and all these were adults but one. No. 3 was produced by a push, the man being drunk. No. 5 came from the blow of a fist. No. 7 was spontaneous, from coughing; and No. 11 from a kick without any provocation.

The following questions have been propounded by Dr. Pellereau:—

“Q. Is the spleen easily ruptured? Is a violent force required?”

“A. Where there is no malaria and the spleen is sound, it is not easily ruptured.”

But where it is enlarged and softened, and especially when it is fixed by adhesions, a push may suffice to lacerate it.

“Q. Is it necessary that the fall or blow should be direct?”

“A. No, the spleen may be ruptured by a counterstroke.”

“Q. Can a spontaneous rupture be distinguished from a traumatic one?”

“A. Not certainly. The spleen may be ruptured by a blow or a fall without any trace of external violence.”

“Q. Can a man continue to walk or work after his spleen has been ruptured?”

“A. He may, certainly.”

“Q. How long may a man live after a rupture of the spleen?”

“A. From some minutes to, at the most, three days.”

Ruptures of the spleen have been reported in our journals, and the question of violence might readily arise here as one to be investigated before a coroner. As the viscus may in conditions of disease be easily burst, it is important to recognize this fact in measuring the degree or design of violence, where such may have been used. R. P. H.

ART. XXXIII.—*Die Krankheiten des Ohres und deren Behandlung.*

Von Dr. ARTHUR HARTMANN, Ohrenarzt in Berlin. 8vo. pp. 200.

Kassel: Theodore Fisher, 1881.

Diseases of the Ear and their Treatment. By Dr. ARTHUR HARTMANN.

THIS is a very good small treatise, printed upon good paper, and neatly bound in muslin, but of value only to the German student or physician. It is too small to be an exhaustive treatise, and too scientific to be a popular manual; but it serves the purpose of, as it were, registering its author among those who practise otology in Berlin. The author has already written some very valuable papers upon otology and laryngology

or rhinology, and has shown himself industrious and competent. As the only province of this book will lie among German readers, it is not worth while to give more space to it here than to say that it is an excellent syllabus of otology.

C. H. B.

ART. XXXIV.—*Frozen Sections of a Child.* By THOMAS DWIGHT, M.D., Instructor in Topographical Anatomy and Histology, Harvard College, etc. Fifteen drawings from nature, by H. P. Quincy, M.D. pp. 63. New York: Wm. Wood & Co., 1881.

IN this handsome volume Dr. Dwight has figured, and elaborately described a number of sections of the neck and trunk of the body of a female child three years of age. The plan of the work is essentially that of an atlas, since each figure is described separately, and the bulk of these descriptions make up the volume. The sections represent successive layers of the trunk as divided transversely to the axis of the vertebral column, beginning at the base of the neck and extending thence to the perineum.

While thus making up a series of studies of the visceral anatomy of a child, the author does not confine his comments to the organs divided, but digresses, oftentimes at length, upon the functions and relations of any of the parts appearing within the section, while such remote subjects as the mechanism of the vertebral column and the respiratory movements, the classification of the muscles of the back, the identification of bones from their fragments, etc., are treated of in a sketchy, but always apt manner. The author appears to have used the sections as convenient receptacles for almost any subjects having anatomical use that interested him. For the most part the style is exact and formal, but it occasionally drops to a colloquial plane, as though the author was addressing a class of students. We thus often see some of the baldest statements of an elementary fact cheek by jowl with the latest-recondite research.

While assuming that the study of sections will play an important part in the anatomical teaching of the future, Dr. Dwight accedes that it is not adapted to all purposes, and mentions among others of its limitations the imperfect idea the method gives of the nature and arrangement of the fasciæ. Many other limitations might be defined, so many, indeed, that we are inclined to believe that the study of sections will be chiefly useful to advanced students in anatomy, who naturally take delight in finding many familiar objects—made familiar by the accepted method of dissection—taking on unexpected shapes when seen on the plane of a transverse section. That the section of itself does not reveal structure satisfactorily, the state of our knowledge of the spinal cord, the optic and other nerves, can be accepted as evidence. Dr. Dwight practically admits its ineffectiveness in studying the course of the cervical nerves. These nerves are represented on Plate I. as passing out horizontally from the spinal cord, while the author carefully informs us that the nerves do not “arise from the cord opposite their points of exit, but somewhat higher.” In like manner check-statements are continually made as to the relations of parts. The relations are those found in the viscera of the dead body, and are those resultant upon the lung being nearly emptied of its air; the diaphragm and the organs of the hypochondriac and epigastric regions elevated, the stomach and other abdominal organs empty, or nearly so. A series of

studies in which all these conditions are reversed yet remain a desideratum in human anatomy.

Dr. Dwight has executed his task with conscientious care and ability, and this book will take its position as the best expression of the study of frozen sections that has been undertaken in this country.

The admirable drawings of Dr. Quincy demands more than a passing notice. Dr. Quincy is one of the most accomplished of living professional draughtsmen, and these plates are the most satisfactory results of his skill that have yet been published.

H. A.

ART. XXXV.—“*La Terza Centuria d'Ovariectomie in Italia.*”

The Third Hundred Ovariectomies in Italy. By Dr. DOMENICO PERUZZI, of Lugo. (*Raccoglitore Medico*, July 20, 1882.)

THE first Italian ovariectomy bears the date of March 26, 1859, and the first success that of September 26, 1868, which was the tenth operation. Of the first hundred completed operations 63 were fatal; of the second hundred 36;¹ and of the third hundred 27. The first hundred covered a period of eighteen years and eight months; the second hundred two years and seven months; and the third hundred one year and eleven months. The chief operators upon the three hundred cases were Dr. Peruzzi, of Lugo, 26 operations, with 18 cures; Prof. F. Marzolo, of Padua, 23, with 11 cures; Dr. F. Franzolini, of Udine, 21, with 8 cures, and Prof. Landi, of Pisa, 9, with 6 cures. In addition to these three hundred cases there were 18 partial operations, 9 of which were fatal; and 8 exploratory ones, four ending fatally. Of the first hundred ovariectomies 3 were double, and all fatal; of the second hundred 6 were double and 5 fatal; and of the third hundred 5 were double, and all successful.

The 27 deaths in the third hundred were due to the following causes, viz., septic peritonitis 10; septicæmia 5; collapse 6; cardiac thrombosis 3; hemorrhage 1; intestinal occlusion 1; and chloroform poisoning 1. The one hundred operations were performed by 46 operators, 28 of whom operated but once, saving collectively 17 women, or a fraction over 60 per cent. One half of the cases were under the care of nine operators, who collectively saved 79 per cent.

The greatly improved results of the third hundred over the first is attributed to the antiseptic treatment of the later operations. The chief value of these Italian records lies in the fact that they are not the statistics of one or a few experienced and expert ovariectomists, such as Mr. Spencer Wells, Dr. Thomas Keith, Mr. Knowsley Thornton, or Dr. Karl Schroeder, but those of all Italy. Seventy-three per cent. of cures is a good result, when we consider that a large proportion of the operators had never had a case before. Would Great Britain, Germany, or America furnish a better general record? We are accustomed to rate the mortality in ovariectomy by the results obtained by world-renowned operators. By the close of 1883 we shall probably have another hundred cases from Italy, from which we may anticipate still better results, as through her journals the foundations of Keith's great success have recently been explained to her gynecological surgeons.

R. P. H.

¹ See this Journal for January, 1881, page 270.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

The Functions of the Cerebellum.

Dr. BAGINSKY (*Arch. f. Anat. u. Phys.*, vi. 1881) has made researches upon the cerebellum. It is well known from the experiments of Flourens, that cutting off layer by layer of the cerebellum causes in birds and mammals uncertain, staggering, and trembling movements; that the subjects operated on lose completely the power to move, to stand, or to fly. Baginsky's experiments were made on narcotized as well as on non-narcotized rabbits. By a longitudinal incision the skin of the occiput was divided, and the skull opened by means of a bone-forceps. Parts of the cerebellum were removed—either by the scissors or the knife. The results of his experiments were as follows: All the rabbits in which a large part of the cerebellar hemispheres were removed alone, or with a part of the vermis, show immediately after the operation notable disturbances. Weakened by the loss of blood, though conscious, they lie upon one or the other side; they cannot keep on their feet, or move from the place. Death of the animals ensued in a few days after the operation, and on *post-mortem* there was found destruction of nearly the whole cerebellum, frequently complicated with hemorrhage into the medulla oblongata down to the medulla spinalis. Four rabbits lived a longer time, and in these only a small part of the vermis had been removed. After the removal of a small superficial part of the vermis the animal exhibited no disturbance of any kind in its movements, or in any other way from that of a normal animal. Only four animals lived longer, and they displayed, a few days after the operation, definite disturbances which were similar but of different intensity. There was trembling of the head and body, which was stronger when the animal was moved forward. In the movement of the feet they exhibited disturbances: the anterior extremity when moved is put down in a false manner; now it is the right, then the left, which is put down on the dorsum of the foot; sometimes the extremities are crossed over each other; sometimes one foot, sometimes the other foot is more extended, abducted, or adducted. Tests of sensibility gave no safe results, as rabbits react differently. These disturbances, at first weak, increase in intensity, till the death of the animal, between the second and fifth week after the operation. B. arrives at the conclusion that destruction of

the vermis alone, and of the anterior upper part of the vermis, only (Nothnagel, to the contrary) calls out disturbances of the equilibrium. B. also made experiments upon dogs, with similar results. He also saw that these disturbances were gradually compensated for, and the question arose if this compensation took place through the cerebellum, or through other paths, perhaps the cerebrum. Under this idea Prof. Munk extirpated for him, on a dog, the sensory centre of the anterior extremity; the cerebellum had been previously operated upon. The dog exhibited the same symptoms as a normal one does whose corresponding sensory centre had been extirpated. Hence, subcortical apparatuses, highly probably located in the cerebellum itself, are contrivances which learn anew to take on the function of the extirpated part. We have in the cerebellum itself, as Munk has shown in the cerebrum, the same peculiarity about the substitution of function.—*Journal of Nervous and Mental Disease*, April, 1882.

The Regulating Respiratory Nervous Apparatus.

DR. J. C. GRAHAM (*Arch. f. d. ges. Phys.*, Bd. xxv. H. 7 and 8) has discovered a new regulating nervous system of the respiratory centre. If, in a rabbit, after opening the abdomen (the thorax unopened), as long a piece as possible of the splanchnic is prepared (which is easiest on the left side), a section is made of it, and the central end is laid upon electrodes, then the breathing is arrested in a state of expiration, the diaphragm is in a state like in an extreme expiratory act, and the expiratory muscles of the abdomen in the state of strongest contraction. This experiment succeeds when the two vagi and sympathetics in the neck are divided. This experiment is said to be very suitable for a demonstration at a lecture, as it never fails. After section of the medulla oblongata in its most anterior part, so that connection with the brain is cut off, still the experiment succeeds. After section of the spinal cord between the 11th and 12th dorsal vertebræ the experiment still succeeds. After section of the spinal cord between the 4th and 5th dorsal vertebræ then the experiment fails. These facts prove that the fibres run in the sympathetic and thus enter the spinal cord, and then ascend to the medulla oblongata. This irritation of the splanchnic succeeds when the animal is in a state of dyspnœa or apnœa.—*Journal of Nervous and Mental Disease*, April, 1882.

The Physiology of the Cervical Sympathetic.

MM. DASTRE and MORAT, after having recognized the existence in the cervical trunk of the sympathetic nerve of vaso-dilator fibres for the bucco-facial region, made a number of experiments to determine the physiology of these nerves, and have just announced their results at a meeting of the Académie des Sciences.

1. Excitation of the posterior segment of the spinal cord, after its section in the cervical region, causes a dilatation of the vessels of the auricular and bucco-facial regions, and of the buccal mucous membrane in the cat, rabbit, dog, and goat.

2. The excitation of the peripheral ends of the anterior roots of the second, third, fourth, and fifth cervical nerves causes a dilatation of the vessels in the corresponding bucco-facial region.

3. If, after the section of the communicating branches between the spinal nerves and the sympathetic, the end which passes to the head is stimulated, the same dilatation is produced. The vaso-dilator nerves, therefore, pass through the sympathetic.

4. Stimulation of the two branches of the annulus of Vieussens produces the same results.

5. And stimulation also of all parts of the cervical sympathetic where it unites with the cranial nerves, especially with the trigeminal.

6. The comparison of the results obtained by stimulation of the sympathetic and of the trigeminal show that the latter nerve receives the greater part of its dilator fibres from the sympathetic.

These nerves may be stimulated by other means more physiological than electricity.

7. The blood in asphyxia stimulates both classes of vaso-motor nerves to activity; but the congestion, the index of the vaso-motor reaction, of the bucco-facial region is less marked on the side on which the sympathetic track has been divided.

These nerves may be stimulated either directly or, as is most usual, reflexly by an irritation coming from the periphery.

The following experiments show the regions in which these different nerves arise:—

1. Stimulation of the vagus nerve in the inferior cervical region produces a bilateral dilatation.

2. The vaso-dilatation ceases or diminishes considerably on the side on which the sympathetic is divided.

3. Vaso-dilatation does not appear on both sides if the animal is deeply chloroformed, or if the cervical spinal cord has been divided at any point.

4. The vaso-dilatation is very marked when the superior laryngeal nerve or the vagus is excited at the origin of its pulmonary branches. When points lower than these are excited no dilatation follows, even if the cardiac nerves are stimulated.

Hence the visceral sensitive nerves which govern this reflex come from the organs of respiration.

5. Excitation of the central end of the sciatic nerve also produces this congestion; stimulation of the tibial nerve, and probably of all the cutaneous nerves, has the same result.

6. After section of the cervical sympathetic trunk, reflex or asphyctic stimulation of this centre can still produce a certain degree of dilatation. When the section has been made sufficiently long to allow of the degeneration of its fibres, stimulation of the superior maxillary nerve can still produce a slight dilatation of the vessel in the lip of the same side. Hence, all the vaso-dilators of this region are not contained in the cervical sympathetic.—*Rev. Scientifique*, Aug. 5, 1882.

Normal and Pathological Sleep.

EMILE LUNG gives the following *résumé* of the propositions established in an elaborate memoir of the above subject.

1. We are only conscious of the phenomena of the exterior world in which we live by the intermediation of our organs of sense which receive and transmit impressions to our consciences, of which the seat is in the brain, the organ of our physical life.

2. In addition to the phenomena of consciousness all sensations are reducible to vibratory movements, which are transmitted one after the other through the nerves to the nerve centres in the brain and spinal cord.

3. The sensitive impressions which are transmitted to the spinal cord are not appreciated by our consciences; they are capable of producing movement in different parts of our bodies, but these movements are effected unconsciously without any effort of will. In physiology they are termed reflex movements.

4. Just as a real sensation can exist without affecting our consciousness, so in certain cases we can be conscious of sensations which have no external reality.

These sensations which are not evoked by an external object are termed hallucinations, and in persons with diseased judgment are interpreted as realities.

5. All sense organs are subject to corresponding sensations.

6. We find in certain peculiar states of the brain, in that of anæmia which produces normal sleep, in that of physical alteration which paralyzes a certain number of our intellectual faculties, the condition characterized by dreams, somnambulism, and hysteria.

7. Hallucinations can be produced in the healthy man by exciting the imagination, securing the attention, or by persuading imaginary sensations.

8. The very fact that our organs of sense are liable to error should render us very careful in estimating their evidence.

9. Provoked hallucinations are obtained with great facility in persons plunged in pathological sleep in consequence of certain procedures or of a special neurotic state.

10. The pathological sleep is preceded or accompanied by such modifications of innervation as lead to catalepsy, hyper-excitability of nerves and muscles, anæsthesia, hyperæsthesia, etc.

11. It is produced in persons who are predisposed thereto by certain procedures known as magnetic passes, hypnotism, physical impressions, such as music, thunder, loud noise, brilliant light, certain perfumes, etc., or by moral impressions, great fright, disappointment, great joy, etc.

12. The phenomena which accompany the condition should be severely criticized in order to detect those due to deception, etc.

13. In the actual state of our positive consciousness it is not necessary in order to explain the so-called magnetic phenomena, to have resource, with Mesmer and his followers, to the hypothesis of a fluid endowed with marvellous properties.

14. The essential cause of these phenomena does not reside in the magnetizer but in the magnetized and in a neurotic state peculiar to the latter.

15. Positive science cannot deny the possible existence in the universe of entirely unknown forces, but it can only speculate as to those which have been duly demonstrated. Without doubt the extent of the unknown is immense, and we should aspire to new conquests by serious and methodic work, eliminating all error due to a diseased imagination or to new scientific interests.—*Rev. Internat. des Sci. Biol.*, July 15, 1882.

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The Movements of the Iris and their Mechanism.

As the results of forty-nine experiments on dogs, cats, goats, and more especially white rabbits, the author, M. Moriggia, comes to the following conclusions, which are recorded in *Moleschott's Unters. zur Naturl.*, etc., xiii., 1, p. 1: In animals which have been kept for several weeks in the dark, the pupil generally dilates more widely in the dark, and contracts more completely in the light, than in those which have been kept in the ordinary conditions as regards light and darkness. Under the same conditions the mydriatics and myotics act much more promptly. The pupil, when dilated (though not to its fullest extent) by atropin, does not contract in response to light. If a concentrated solution of atropin be dropped into one eye, in goats and rabbits, it has little or no effect on the pupil of the other eye; in albino rabbits, however, it acts very powerfully on the other eye. Even when the pupil is dilated as widely as possible this condition yields at once when the superior cervical ganglion of the sympathetic is extirpated. On stimulating the uninjured cervical sympathetic by means of an induced current, the pupil is widely dilated. The mydriatic action of atropin is less marked on the side from which the superior cervical ganglion has been removed,

whether its removal has been effected before or after the application of the atropin. On subjecting rabbits to very severe and general muscular exertion, a transient, but very marked, mydriasis was noticed; but this was always less marked on the side on which the uppermost cervical ganglion was wanting. The highest degree of dilatation induced by the use of atropin gives place to contraction when the animal is caused to bleed to death through a wound in the heart. On the other hand, the myosis induced by copious hemorrhage passes into pronounced and permanent mydriasis if atropin be dropped into the eye of an animal just dead, even on that side on which the superior cervical ganglion of the sympathetic had previously been extirpated.—*Glasgow Med. Journal*, May, 1882.

Results of Obstructed Pulmonary Circulation.

M. FRANÇOIS FRANCK has communicated to the Bordeaux Medical Society some instructive results of the experimental obstruction to the pulmonary circulation. The effect of a hindrance to the circulation of blood through the lungs in causing engorgement of the right heart, and secondary insufficiency of the tricuspid orifice, is one of the most familiar facts in medicine. M. Franck's object was to produce this experimentally in order to study more closely the physiological conditions and symptoms, one of which was the chief subject of the communication—viz., the indications of the pulmonary obstruction which are afforded by the jugular veins. The phenomena may be produced by the tracheal insufflation of irritant vapours, such as sulphurous acid, the animal having been rendered insensible by chloral or motionless by curara. This sets the whole contractile mechanism of the lung into energetic action, the muscular tissue of the bronchial tubes and of the vessels. Hence there is a retraction of the whole lung, indicated by the depression of the costal walls, and there is also a diminution of the calibre of the pulmonary vessels, causing an engorgement of the right side of the heart. If the obstruction lasts long enough and is sufficiently intense, the feeble parts of the wall of the right ventricle—*i. e.*, the part above and to the right—yield to the excess of internal pressure, and drag outwards the papillary muscles, and the chordæ tendineæ, and with them the free edge of one of the segments of the tricuspid valve. By this mechanism, which was pointed out by King in 1837, temporary tricuspid regurgitation occurs, and causes a venous reflux, visible as the jugular pulsation synchronous with the ventricle systole. The tricuspid insufficiency and venous pulse continue as long as does the engorgement of the right side of the heart. This "safety-valve action," as King called it, may be thus constantly produced artificially. The analogy between this induced condition, and that which occurs in every paroxysm of spasmodic asthma, is sufficiently close, and there can be no doubt that in the latter the same cardiac phenomena occur. It is probable that the production of this tricuspid reflux is facilitated by certain conditions of the heart itself. The diastolic relaxing influence of the pneumogastric nerve undoubtedly plays an important part in the experimental production of this condition, and no doubt also in its clinical production. M. Potain has insisted on the transient tricuspid regurgitation which seems to be produced by a nervous mechanism under the influence of strong irritation of the abdominal viscera, acute affections of the liver, intestine, and stomach. The reflex action may probably be double, and the effect produced not only by cardiac inhibition, but also by obstruction to the pulmonary circulation.—*Lancet*, July 22, 1882.

MATERIA MEDICA AND THERAPEUTICS.

The Excretion of Mercury.

Dr. SCHUSTER, of Aix-la-Chapelle, publishes some interesting investigations, made under his direct observation, upon this subject. Experiments of other observers, viz., Vajda and Paschkis in Vienna, and afterwards Oberländer, have gone to show that mercury may be found in the urine of the majority of cases undergoing mercurial treatment, and especially treatment by inunction. These observers also claim to have discovered the presence of mercury, not only two, three, or six months after the suspension of the treatment, but even after as long as two, five, and twelve years. The method employed consisted of three processes: 1. Separation of the mercury from the fluid containing it by means of some metal (zinc or copper) in a state of extremely fine division, forming an amalgam; 2. Driving off the mercury from this amalgam by means of heat; 3. Conversion of the mercuric vapour into the easily recognizable mercuric iodide. Dr. Schuster now points that the metal used to form the amalgam has hitherto been the ordinary zinc-dust (zinkstaub¹) of commerce, which contains, besides arsenic and antimony, an alloy of certain other metals. Each of these he submitted to the iodide test, and, in the cases of antimony and arsenic, obtained results which might easily be mistaken for indications of the presence of mercury. To avoid the possibility of this error, he caused a series of experiments to be made, using a preparation of copper and zinc, known as "lametta," which is free from the admixture of other metals. The experiments were carried out by an experienced analytical chemist, and in a few cases the feces as well as the urine were examined for the presence of mercury. Forty-one cases are recorded which had been under some form of mercurial treatment, in many cases by inunction of ointment, or of mercuric soap. and, in a few, by injection of mercuric cyanide. In some cases opportunity was given for examination of the urine after long intervals.

The results obtained were as follows: Of fifty-two analyses of urine, thirty-two gave negative and twenty positive results. Of the positive cases, mercury was never found in the urine earlier than from the seventh to the twelfth day after the beginning of the treatment. Ten of the positive results were obtained during the treatment, and ten within three weeks after it. Of the thirty-two negative results, fourteen were obtained during long-continued treatment, and eighteen after it. In no single case was any positive result obtained after the sixth month from the suspension of the treatment.

In several of the cases the feces as well as the urine were examined, and, without exception, more abundant evidence of the presence of mercury was obtained in them than in the urine; but in the cases investigated one year after the cessation of the treatment, no positive result could be obtained in either.

Although his opportunities of examining the feces were only few in comparison with the urinary examinations, Dr. Schuster lays stress upon this fact, that, in all the experiments upon feces, the expected results were obtained; whereas, in the case of the urine, many of the experiments ended in a directly negative result, even in cases where the physiological effects of mercury were manifest in the patient at the very time when the examined urine was excreted.

He sums up the results of his inquiries thus: "During mercurial treatment, the mercury appears very soon in the feces, often to a considerable amount;

¹ A secondary product in the manufacture of the pure metal. It consists of minute particles of metallic zinc, more or less oxidized, and, at the same time, small quantities of the other metals named, and of cadmium.

and this excretion appears to be fairly constant, and lasts even for weeks after the cessation of the treatment. After one year, however, no trace of it appears. The excretion of mercury may take place also in the urine, but, even during the treatment, it is not constant, and may last after its cessation, irregularly, for a long period. It cannot be traced after six months. The retention of mercury in the system for years is, therefore, highly improbable."

The method employed in the examination of the feces consisted in deodorizing by stirring with bromine, then evaporating to consistence of a thick syrup. This was then treated with a mixture of concentrated nitric and hydrochloric acids (1 to 3), and evaporated over a water-bath until no further smell of acid could be perceived. The residue was then digested in hot water and filtered, the filtrate being tested in the same manner as the urine.—*London Med. Record*, July 15, 1882.

The Physiological and Therapeutic Action of Phosphorus.

M. DU MOULIN (*Rev. de Théra.*, Feb. 1, 1882) presented to the Brussels Academy of Medicine, on the part of M. Lesseliers, of the Clinic of the University of Ghent, the report of a case of poisoning by phosphorus observed in his hospital practice. The case, M. Du Moulin remarks, raises and illustrates several important points in the toxicology of phosphorus. 1. The symptomatology of poisoning by phosphorus is sufficiently advanced to allow the diagnosis of this kind of poisoning, notwithstanding the absence of the poisonous agent, and the obstinate denial of the patient. 2. The poisoning having been effected by a relatively small quantity of phosphorus, it has been possible to follow its regular evolution and to observe the successive invasion of all the organs—the stomach, liver, heart, muscles, bloodvessels, mouth, and kidneys. 3. It has especially afforded the opportunity of verifying the condition of the various secretions, and of pointing out in the latter changes which were by no means expected. Thus the urine became not only icteric, but at the same time alkaline and albuminous, and the earthy salts had almost completely disappeared from it. Its density was 1006, the urea was reduced from 15 to 25 per thousand, the normal amount, and to 3.3 per thousand. At the same time, the urine contained leucine and tyrosine. The feces were discoloured (icteric) and mixed with a little blood; the sweat was alkaline; the vomit (a mixture of gastric juice and mucus) was alkaline; on the other hand the saliva was strongly acid; the lachrymal secretion remained alkaline. 4. Essence of turpentine, administered on different occasions, was rejected each time immediately after its ingestion. Gargles of chlorate of potash having been prescribed to soothe the inflammation of the mouth, the patient swallowed by inadvertence the greater part of the solution. M. Du Moulin, finding after this a sensible improvement in the condition of his patient, and also remembering that M. Husemann had recommended chlorate of potash in phosphorus poisoning, continued the administration of that agent. A few days afterwards, the patient was completely well. Without wishing to affirm that the cure should be attributed to the action of the chlorate of potash, M. Du Moulin is of opinion that in cases of this kind it would be well to employ this medicine, either alone or conjointly with essence of turpentine, according as the patient is or is not able to tolerate the administration of the latter drug.—*London Medical Record*, May 15, 1882.

Action of Resorcine.

M. CALLIAS has made a number of experiments in M. Hayem's laboratory, from which we draw the following conclusions:—

Resorcine has the same properties as carbolic acid, salicylic acid and other members of the aromatic series; it prevents fermentation in 1 per cent. solution,

and putrefaction in 1.5 per cent. Resorcine is a less active poison than carbolic acid.

In doses of from 30 to 60 centigrammes per kilo. of body weight, resorcine produces trembling, chronic convulsions, and acceleration of circulation and respiration. All these symptoms disappear in an hour; sensation and consciousness are not affected.

When larger doses are given, vertigo and loss of consciousness are produced, and sensibility is reduced. The clonic convulsions are violent and frequent, and are most marked in the anterior extremities. The pupils are dilated and the respiration and heart greatly accelerated; temperature is little affected. The effects pass off in from one to two hours.

When 90 centigrammes per kilo. are given, death occurs in about thirty minutes, preceded by the same symptoms, only more marked, while the temperature gradually rises without exception to 41° at the time of death.

Cadaveric rigidity appears ordinarily about fifteen minutes after death.

Resorcine is then an excitant of the central nervous system.

Resorcine has no morphological effect on the blood, unless brought in direct contact with it.

It can be utilized both internally and externally in all diseases due to contagious germs, or which are favourable to their development, and in which the other members of the aromatic series are employed.

Its anti-rheumatic and anti-pyretic value has not yet been established.—*Rev. Scientifique*, July 22, 1882.

A New Cardiac Remedy.

At the meeting of the Académie de Médecine, Paris, July 4, 1882, M. GERMAIN SÉE read a paper on the Value of *Convallaria Maialis*, or Lily of the Valley, as a remedy in certain forms of heart disease.

The conclusions arrived at were based on experiments on both cold and warm-blooded animals, and in seventeen cases of various forms of cardiac disease in man, in which this new drug was employed. The following are his conclusions:—

1st. The *convallaria maialis*, or lily of the valley, is an important cardiac remedy.

2d. In the form of the aqueous extract of the whole plant, given in the dose of from gr. 15 to 20 daily, the *maialis* produces constant and favourable effects on the heart vessels, and the respiration, slowing the beats of the heart, establishing the normal rhythm, increasing the force of the heart and the arterial pressure. The respiration becomes deeper and the sense of suffocation and the desire for air less troublesome and painful.

3d. The most powerful, constant, and useful effect is its diuretic, which renders it of great use in dropsies of cardiac origin.

4th. The therapeutic uses may be thus formulated:—

(a) In palpitation due to an exhaustion of the vagus nerve, or paralytic palpitations, which are much more common.

(b) In simple want of rhythm, with or without hypertrophy of the heart, and with or without lesions of the orifices or valves of the heart.

(c) In mitral stenosis, especially when accompanied by a want of compensatory force of the left auricle and right ventricle. Under the use of the drug the contractile power decidedly increases, as is shown by sphygmographic tracings.

(d) In insufficiency of the mitral valves the good effects are particularly well marked, when there is a passive congestion of the lungs, and as a result more or less dyspnoea.

(e) In aortic regurgitation (Corrigan's disease) the good effects show themselves in the pulse and the increased ease of respiration.

When the left ventricle does not give evidence of compensatory hypertrophy the *maialis* is especially indicated, for it gives strength and energy.

(f) In dilatations of the heart, with or without hypertrophy, with or without fatty degeneration, with or without sclerosis of the muscular tissue, this drug fulfils all the indications.

(g) Finally, in all cardiac affections giving rise to dropsy and anasarca the remedy has prompt and certain good effect.

(h) It has less effect on the dyspnoea which accompanies disease of the heart.

5. There are no contraindications, for the remedy is applicable to all the affections of the heart. In addition to that it has no bad effect on the cerebro-spinal system, nor on the digestive organs. Moreover, it has no cumulative effect nor unpleasant after results.

6. For these reasons *maialis* is superior to *digitalis*, which we are often obliged to give up, or at least reduce the dose of, on account of the vomiting, loss of appetite, digestive disorders, cerebral excitement, and dilatation of the pupil, which it so often produces after a more or less prolonged use. *Digitalis* often brings about a weakness of the heart and an increase in the number of the contractions, and, in short, often has directly opposite effects to those desired.

7. To combat cardiac dyspnoea *maialis* is inferior to morphia, and more particularly to the preparations of iodine, but morphia tends to cause suppression of urine.

The combination of *maialis* with iodide of potassium constitutes a most valuable means of combating cardiac asthma.

8. Finally, in diseases of the heart associated with dropsy, *maialis* surpasses all other drugs, even when it is not associated with other diuretics.—*Bul. Gén. de Thérapeutique*, July 30, 1882.

The Danger of Iodoform Dressings.

The search for an antiseptic body which shall be a powerful germicide, and yet not injurious when absorbed by the human organism, still continues. Not long ago, Mikulicz, and many other surgeons in Germany, enthusiastically extolled the merits of iodoform; and it has been widely used both in that country and, though to a less degree, in England. For a time, all seemed to promise well with the new drug, but gradually we began to learn its demerits; and recent experience seems to show that its use, under certain conditions, as yet not fully explained, may give rise to most serious, perhaps even to fatal, results. Iodoform was introduced into England some years ago, as a local application which was of great use in the treatment of spreading ulceration, and especially of the local contagious ulcer. Gradually its use extended; it gained much favour with gynaecologists, especially for the purpose of correcting the fetor of ulcerating cancer of the womb; it was blown into the nose and into the ear, and, made up into a bougie, introduced into the male urethra. About two years ago, Mikulicz recommended it as a dressing after operations, major and minor, on the ground that it was a powerful antiseptic, and yet did not irritate the parts. Its employment was said to be especially advantageous in the treatment of scrofulous joints; and those who adopted this line of treatment did not hesitate to open freely a knee-joint affected with tumor albus, and introduce iodoform in large quantities into the cavity of the joint; in such a case, an outside dressing of cotton-wool, treated with iodoform, was applied, and left undisturbed for a month or more. No great care seems to have been taken to estimate the quantity of the drug used in such a dressing; it

was ladled out of a bottle into the joint, and no ill effects appeared to follow. Now, Dr. Ringer pointed out last summer that iodoform was a heart-poison; he found that one-fifth of a grain would almost arrest the frog's heart. Such an experiment as this prepared us for the clinical observations detailed by Dr. Max Schede, of Hamburg, who, in an important paper, published recently in the *Centralblatt für Chirurgie*, drew attention to the toxic action of the drug. He found that, in certain cases, its use is followed by an enormous increase in the frequency of the pulse, which runs up to 180, even in the adult, without any marked rise of temperature, or any general symptoms beyond some disquietude, *malaise*, and loss of appetite; in other cases, in addition to the rapid and feeble pulse, there are some fever and headache; in both of these classes of cases the withdrawal of the drug is immediately followed by a disappearance of the symptoms. In other cases, where the rapidity of the pulse is very great, and the temperature very high (104° F. or more), the danger to the patient, in spite of the absence of marked general symptoms, is also greater—inasmuch as the withdrawal of the drug is not always followed by an immediate cessation of the symptoms. By far the most serious form that iodoform poisoning takes, however, is that in which the sensorium is deeply involved; in children, the symptoms closely resemble those of meningitis, and have been frequently rapidly fatal, in spite of the immediate withdrawal of the drug. The child, who may have been in excellent health for some weeks under the use of iodoform dressings, suddenly becomes very ill, the pulse grows rapid, with irregular or perhaps very slight pyrexia, vomiting is severe, consciousness is disturbed or lost, and there are localized paralyses. It has been urged that probably, in Schede's cases, these symptoms did in reality depend upon a rapid meningitis—perhaps of a tubercular nature, for the patients have generally been strumous children; but this we do not believe to be a complete explanation, because, among other reasons, we are acquainted with a case of this kind which recently occurred in a London hospital, where symptoms pointing, as it was thought, most unmistakably to meningitis, entirely disappeared when the affected joint was freed from iodoform. In Mr. Stanley Boyd's report of four cases, in the wards of University College Hospital, drowsiness and stupor were observed in two patients, symptoms of meningitis in one, and delirium in a fourth, which ended fatally. Both Schede and Küster say that the drug can cause sudden collapse and death; but of this there does not appear at present to be sufficient proof.

Iodoform is an iodine-compound, chemically analogous to chloroform; its composition is represented by the formula CHI_3 ; it contains therefore 96.7 per cent. of iodine. From this fact, it has been argued by some, wise after the event, that its use in large quantities must be injurious: but, what do we know of the toxic properties of iodine itself? Very little, in fact. Iodine has been injected into the cavity of the pleura without ill effect, and, combined with potassium, enormous doses can be tolerated. Rather does the above account of the symptoms it can produce tend to approximate it somewhat to chloroform in its therapeutics; and he would be a bold man who would maintain that the symptoms of chloroform poisoning were due to the chlorine in its composition. A writer in the May number of the *London Medical Record*, to whom we are much indebted, adopts the view of Dr. Mundy, of Vienna, who contends that the toxic or fatal symptoms have been due to the reckless manner in which large quantities of the drug have been used. No doubt, this is perfectly true; but it does not seem to explain all the phenomena. In the first place, it is comparatively rare to get any symptoms of poisoning at all. There are surgeons in this country who have used the drug in large quantities at a time, and have never met with a single case of poisoning; and, in a great proportion of the cases reported, the symptoms did not appear

until after the continuous use of the drug for two or three weeks. We are loth to fall back on Dr. Max Schede's theory of a peculiar idiosyncrasy; and, before doing so, we would certainly desire more complete observations, especially with regard to the urine. The supposed cumulative action of other drugs—of digitalis, for instance—has been distinctly traced to renal disturbances. So long as the kidneys discharge their functions vigorously, so long is the poisonous substance rapidly eliminated from the blood, and gives rise to no symptoms; but if, from some cause, the urinary excretion is checked, then the poisonous body accumulates in the blood, and gives rise to its characteristic symptoms. For this reason, we think that a careful examination of the urine, where iodoform is being used, may not only throw light on the way in which it produces toxic symptoms, but may also furnish a timely warning of their approach.

Lastly, we are informed that Professor Kocher, of Berne, has been struck by the resemblance between the symptoms of iodoform and of chloroform poisoning, and that he has encountered one case where the onset of the symptoms was marked by signs of acute nephritis.—*Brit. Med. Journ.*, June 17, 1882.

Poisoning by Iodoform.

In response to Prof. König's appeal to his colleagues, that they should publish the results of their experience with iodoform, Schede of Hamburg, in the *Centraltbl. für Chir.*, No. 3, 1882, relates some of the ill-effects he has observed following the use of iodoform in the Hamburg Hospital, and also points out some contra-indications to its external application (*Deutsche Med. Zeit.*, Feb. 2, 1882). He gives, however, no exact account of the quantity used in dressing large and small wounds, so that his results do not in any way contradict those of many conscientious observers who have not seen these bad effects following cautious administration. He says that there are persons who possess a peculiar idiosyncrasy towards iodoform, which is not to be found out until, without any warning, it suddenly appears in the most severe symptoms of poisoning, and may lead to the rapid death of the patient, even though the administration be immediately suspended. These symptoms he divides into six groups. 1. There may be elevation of temperature to 104° Fahr., and more, without other phenomena (so-called "aseptic fever"). 2. In addition to fever, there may be depression of spirits, headache, loss of appetite, taste of iodoform in the mouth, the pulse being often very rapid, while at the same time it is small and compressible. On stopping the drug, these symptoms at once disappear. 3. The pulse-rate may be increased to 150 or 180, and more. In spite of rapid cardiac action and small pulse, with anxiety, etc., amelioration may take place in this condition on stopping the drug; but there is, nevertheless, great danger. This condition may arise after the first application of an iodoform dressing, or it may only set in after toleration has been established for weeks. 4. The alarming rapidity of the pulse is accompanied by high fever, yet the sensibility is not diminished, and no symptoms of septicæmia arise, but the suspension of administration is not followed by reaction, and death follows. 5. After severe operations, although the pulse is very good, rapid collapse sets in, ending in death. It is, however, a question whether this is solely due to the iodoform. 6. The most alarming and, by the relative frequency of their occurrence, as well as suddenness, most dangerous forms of poisoning, are the disturbances of the cerebral functions, which either take the form of acute meningitis, or of a psychological disease (melancholia, etc.), and lead to a fatal termination, even though no elevation of temperature of a particular kind take place, and the application of the drug has been immediately suspended. Schede says that large fresh wounds should not be filled with iodoform, as it becomes impacted in the

open tissue-spaces, so that it can only be removed with the spontaneous separation of the scab. Even smaller wounds do not offer security against absorption, although there is less danger in granulating surfaces. Dressing with the iodoform-gauze, as well as the use of the gelatine points, in uterine diseases, he declares to be more safe; but there is no protection against erysipelas in iodoform.

Küster, in a recent paper (*Berl. Klin. Woch.*, No. 14, 1882), lauds the application of iodoform in powder to open wounds, but relates several cases of fatal intoxication, in which the symptoms were much the same as those described by Schede, viz., 1, disturbances of the digestive tract; 2, fever; 3, a peculiar influence on the central nervous system, characterized by depression, melancholia, dilatation of the pupils, apathy, uncleanness (involuntary motions and urination), hallucinations, etc.; 4, rapid collapse and death. He also comes to the conclusion that it offers no protection against erysipelas; and he has found it to act as a foreign body, and to produce a peculiar phlegmon, in spite of which the wound preserves its thoroughly aseptic character. Independently of these drawbacks, he has, however, obtained astonishing successes with iodoform in checking decomposition, and in the treatment of tubercular diseases, against which carbolic acid was powerless; and he is of the decided opinion that resections are now much more successful in his clinic than formerly. Under these circumstances, great caution is necessary, however, and an indiscriminate use of this antiseptic is to be strenuously deprecated.

In the same number of the *Berl. Klin. Woch.*, Dr. J. H. Mundy, of Vienna, most energetically advocates the use of iodoform as a first dressing on the battlefield, it being, in his opinion, the safest and most reliable, as the application of Listerian dressing is impossible, and he has not seen it successful in his extended experience of military surgery. It requires no water to make solutions, nor clean vessels, and, if supplied to surgeons and assistants in suitable cases for carrying about the person, can be immediately applied to the first and second lines, where vessels and water are scarce, and there is no time for circumstantial dressing. He believes that the fatal cases were the result of putting too much iodoform into the wound (80 to 300 grammes at once!), and points out that many of the patients who died were anæmic, either very young or very old, subjects of old-standing suppuration, etc., and that on minutely examining the cases of Mikulicz, Schede, König, Hoeftmann, and Czerny, it is found that many of the patients suffered from organic disturbances, only revealed post mortem, and which may have been the cause of death just as much as the iodoform. In others, the account of the post-mortem examination is either not given, or only so vaguely as to leave it impossible to draw any conclusion therefrom. In applying the dressing, Mundy recommends that only a small quantity of the powder be dusted into the wound, that it be only removed when absolutely necessary, and that tight sutures and bandages be not applied, as it is by these and by the constant removal of the dressing to uselessly wash and reapply iodoform that its rapid absorption is promoted. He believes that in iodoform we have now obtained the only possible antiseptic dressing for the first lines, hitherto out of the question. That it is necessary to exercise great caution in using a drug containing 96 per cent. of nascent iodine is, in his opinion, a matter of course; but do not carbolic acid and salicylic acid—in fact, nearly every antiseptic or drug—induce evil effects when recklessly applied or administered? Lastly, he advises that every military surgeon should be supplied with a belt and leather box, in which to carry a supply of iodoform in perforated tins, so that an immediate and handy means of applying antiseptic dressing could be in his power, wherever situated.—*London Medical Record*, May 15, 1882.

Action of Disinfectants.

R. KOCH (*Mittheil. der Kaiser. Gesundh.* 1881, Band x.; *Rep. der Analyt. Chemie.*, 1882, No. 1) has tested the ordinary disinfectants in three ways. 1. To ascertain whether a particular disinfectant is capable of destroying the resting-spores of bacilli (the latter form the greater part of pathological bacteria), which are the most difficult of all forms of life to destroy. Every disinfectant is to be removed from the list of the disinfectants which may be generally used in infectious diseases, when it cannot destroy the developing power of the resting-spores. The resting-spores of splenic fever were generally employed for experiment. 2. To ascertain how the disinfectant behaves with regard to more easily destructible fungi, yeast, bacteria, bacilli, and micrococci. 3. To ascertain whether the disinfectant is capable of arresting the development of micro-organisms in suitable alimentary beverages.

Carbolic acid did not prove itself to be a sovereign disinfectant. A 5 per cent. solution only sufficed after two days to arrest the developing power of splenic fever spores; while a 1 per cent. solution destroyed in two minutes the bacilli themselves of splenic fever. A solution of 1 in 850 sufficed to check the development of the latter. A soaking, five to seven times repeated, in a 5 per cent. solution of phenol, was sufficient to only retard the development of the resting-spores of splenic fever. The fact is very noticeable that carbolic acid in oil, or in alcoholic solution, is absolutely without effect on the bacilli and spores of splenic fever. The latter, after remaining 110 days and 70 days respectively, in a 5 per cent. solution of carbolic acid in oil and in alcohol, were repeatedly found intact. The same was the case with *salicylic acid* and *thymol*. In the form of vapour better results were obtained with carbolic acid, only at higher temperatures. But even the action of carbolic acid vapour at 75 deg. Cent. for two hours, failed to destroy the resting-spores completely. Chemical combinations of carbolic acid with other bodies, or cheap raw products containing carbolic acid, were less efficacious than the pure preparation. A 5 per cent. solution of zinc sulpho-carbolate, destroyed the resting-spores of splenic fever in five days; a 5 per cent. solution of sodium phenate (carbolate) in ten days merely reduced their power of development, while sodium sulpho-carbolate failed to do this within the same period of time. Crude wood-spirit, and pyroligneous acid in a concentrated state, destroyed the resting-spores in twenty and two days respectively; while wood and coal-tar, in a moderately concentrated condition, had no effect.

Sulphurous Acid.—Even under such favourable conditions as are not attainable in practice, sulphurous acid fails to destroy all minute living organisms. The experimenter says this is a very uncertain disinfectant, as is also calcium bisulphate.

Zinc Chloride.—In spite of the prevalent opinion that a solution of 1 in 1000 of this agent is a safe disinfectant, it was found that even a 5 per cent. solution failed within a month to weaken the developing power of the splenic fever spores.

After testing various other substances, Koch concludes that the only certain disinfectants are chlorine, bromine, and corrosive sublimate; and that to arrest development, only corrosive sublimate, certain ethereal oils, thymol, and allyl-alcohol are available. Bromine vapours are recommended for confined spaces. Chlorine is a little less satisfactory, but more so than was formerly supposed. In all places where neither gases nor heat are available, corrosive sublimate, and indeed all the mercurial salts are recommended. A solution of 1 per 1000 of the mercuric chloride, sulphate, or nitrate, killed the resting-spores in ten minutes;

and, indeed, simple moistening of the earth containing the spores with this solution is sufficient to arrest their power of development. Solutions of 1 in 1000, to 1 in 15,000, are sufficient to kill micro-organisms. The poisonous action of such diluted solutions may be disregarded. The cost also is far below that of carbolic acid.—*London Med. Record*, Aug. 15, 1882.

Action of Disinfectants on Anthrax Virus.

Actual experiment with morbid germs is the only way of acquiring definite knowledge on the value of disinfectants. Moreover, there is reason to believe that there are vast differences in the power of resistance possessed by germs of different kinds, so that it cannot be assumed that the results obtained with one are true of another. More facts are still needed, and we note therefore, with interest, a series of experiments which have been made at Lyons by Arloing, Cornevin, and Thomas on the influence of various disinfecting agents on the virus of symptomatic anthrax. The results have been published in the *Lyons Médicale*. If pulp from the tumours in this disease is allowed to dry slowly at a temperature of 35° C., a residue is obtained in which the organisms of anthrax retain their full activity. A few cubic centimetres of water, through which a little of the residue is diffused, has a virulence not inferior to that possessed by the fresh virus, and which continues for at least two years. The experiments on the influence of disinfectants were carried out with this dried virus, and also with perfectly fresh virus. It was found that the resisting power of the former is much greater than is that of the latter. Whatever destroys the dried is capable of destroying also the fresh virus, while the converse is not true. The different substances tested were left in contact with the virus for forty-eight hours, and the test of virulence was the hypodermic injection of five drops. The following substances were found to have no action even upon the fresh virus: alcohol saturated with camphor or with carbolic acid, glycerine, ammonia, acetate and sulphate of ammonia and sulphate of ammonium, benzine, a saturated solution of chloride of sodium, quicklime and lime-water, polysulphide of calcium, a one-in-five solution of chloride of manganese, a one-in-five solution of sulphate of iron, a one-in-five solution of borate of soda, a one-in-five solution of tannic acid, a one-in-ten solution of sulphate of quinine, a one-half solution of hyposulphite of soda, essence of turpentine, and monobromide of camphor; of gases, ammonia, sulphurous acid, and chloroform. A saturated solution of oxalic acid, a one-in-twenty solution of permanganate of potash, a one-in-five solution of soda, vapour of chlorine, and of sulphide of carbon destroyed the activity of the fresh virus, but had no effect on that which had been dried, while the activity of the latter was destroyed only by solutions of carbolic acid (2 per cent.), salicylic acid (1 in 1000), nitrate of silver (1 in 1000), sulphate of copper (1 in 5), boric acid (1 in 5), saturated salicylic alcohol, corrosive sublimate (1 in 5000), and bromine vapour.

Thus many substances unanimously regarded as antiseptics were without effect upon the virus, even in the fresh state. Pure or camphorated alcohol is largely used by surgeons in France to wash their instruments, but is evidently capable of giving only an illusory safety against morbid germs. Quicklime, in which it is often recommended that the bodies of animals dying of anthrax should be buried, and with which the walls of infected places are washed, is no better. At the moment of its hydration some organisms are probably destroyed by the heat which is disengaged, but those which are not in immediate contact with the lime seem to have preserved all their activity. Very thin layers of the tissue of the tumours of anthrax were taken and rolled up and plunged into the quicklime, and left in it for forty-eight hours. At the end of that time they were rubbed

up with water, and the liquid was found to possess full virulence. The inutility of tannic acid suggests the question whether tanning is really adequate to destroy the poison in the hides of the affected animals, and it is clear that salting has no influence on the virus contained in the flesh, etc. Quinine, so powerful in the paludal diseases, which are now believed to be due to organisms, was found to have no influence over the bacteria of anthrax. Ammonia and its compounds were also powerless. Ammoniacal fermentation, therefore, which is said to destroy some bacteria, does not influence those of anthrax. Sulphate of iron and chloride of manganese, substances which have been strongly recommended as disinfectants, were equally powerless. Further, the sulphurous acid, which is so potent in action upon some parasites of high organization, and on many forms of virus, has no influence on the bacteria of symptomatic anthrax. Chlorine and sulphide of carbon, which destroy the fresh virus, are powerless against that which has been dried. Of all the vapours bromine is the only one which seems to offer complete security. Another important result, from a surgical point of view, is the action of carbolic acid. A two per cent. aqueous solution destroys the activity of the dry virus, but all the power is lost if the carbolic acid is mixed with alcohol. This fact has already been noted by Koch with regard to other kinds of spores. On the other hand, salicylic acid mixed with alcohol preserves its power. Turpentine, recommended by Pasteur for the purpose of destroying the bacillus of true anthrax, has no influence on that of symptomatic anthrax. At the head of the efficient agents stands corrosive sublimate, of which a solution of one in five thousand is sufficient; next come in order nitrate of silver, salicylic acid, and carbolic acid. A two per cent. solution of the latter was found, however, only to destroy the organisms when it had been in contact with them for eight hours in the case of the fresh virus, and for twenty hours in the case of that which had been dried.

The practical deductions from these experiments are obvious, and are of the highest importance. So far as their use against symptomatic anthrax is concerned, the choice of agents to destroy the fresh virus in stables, etc., is a wide one. That for the dried virus, however, is more limited; only the bromine vapour can be regarded as affording complete security. For washing down places the most efficient agent, corrosive sublimate, is rather dangerous. Solutions of sulphate of copper, carbolic acid (2 per cent.), or salicylic acid (0.1 per cent.) are recommended. For the effectual disinfection of carcasses, however, no agent should be trusted but combustion; but if this is impossible it should be cut deeply and treated with corrosive sublimate, sulphate of copper, or carbolic acid.

Practitioners of veterinary medicine have the great advantage of being able to bring these questions to the test of experiment much more perfectly than is possible with regard to many of the diseases of man. It would be extremely important, for instance, to have a similar series of experiments as to the influence of the various disinfectants on the virus of scarlet fever and other maladies which are not transmissible to the lower animals. Too little regard has certainly been paid to the differences possessed by different germs in their capacity of resistance, and the results obtained in the case of one have been applied too freely to all.—*Lancet*, July 1, 1882.

MEDICINE.

Hyperpyrexia in Acute Rheumatism.

The Special Committee of the London Clinical Society appointed to report on this subject offer the following conclusions:—

1. That cases of hyperpyrexia in acute rheumatism appear to prevail at certain

periods, having in the last decade been remarkably numerous in the years 1873-76. whereas latterly they appear to have been much less frequent. That such excess corresponds in a certain degree, but not in actual proportion, to a similar excessive prevalence in acute rheumatism generally. That the largest number of cases of hyperpyrexia arose in the spring and summer months. whereas rheumatism is relatively more common in the autumn and winter.

2. That whilst very little difference obtains between the two sexes in regard to proclivity to rheumatism, the proportion of males to females exhibiting hyperpyrexial manifestations is 1.8 to 1. But that as to age no such marked difference exists; nor as to occupation.

3. That the subjects of hyperpyrexia show no undue rheumatic tendency as regards family predisposition.

4. That cases of hyperpyrexia preponderate in first attacks of rheumatic fever.

5. That hyperpyrexia is not necessarily accompanied by any visceral complications, but may itself be fatal. The complications with which it is most frequently associated are pericarditis and pneumonia.

6. That the mortality of these cases is very considerable, hyperpyrexia being one of the chief causes of death in acute rheumatism.

7. That although present in a certain number of cases, and then of much value from their prodromal significance, neither the abrupt disappearance of articular affection, nor similarly abrupt cessation of sweating, is an invariable antecedent of the hyperpyrexial outburst.

8. That the supervention of delirium or other symptom of nervous disturbance is very frequent either antecedent to or simultaneous with the hyperpyrexia.

9. That there is considerable variability in the date of the occurrence and in the duration of the hyperpyrexial condition, ranging, according to our observations at least, from the 4th to the 30th day.

10. That when death results it has occurred mostly in the 2d and 3d week of the rheumatic attack.

11. That the post-mortem examinations in a certain proportion elicited no distinct visceral lesions, and that when present the lesions are not necessarily extensive.

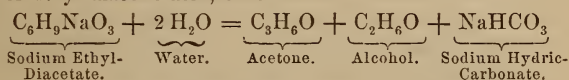
12. That the prompt and early application of cold to the surface is a most valuable mode of treatment of hyperpyrexia. That the chances of its efficacy are greater the earlier it is had recourse to. That the temperature cannot safely be allowed to rise above 105° . That failing the most certain measures—viz., the cold bath—cold may be applied in various other ways; by the application of ice, by cold affusions, ice-bags, wet sheets, and iced injections.

The Committee did not think it advisable in the present report to enter into theoretical considerations, and limiting the study of hyperpyrexia to the records of 67 cases of acute rheumatism, deemed it premature to enter into physiological reasonings until the same conditions had been reviewed in other acute febrile diseases. The report is signed by Drs. R. Southey, H. Weber, W. M. Ord, F. Taylor, T. Barlow, and S. Coupland.—*Lancet*, June 3, 1882.

Diabetic Coma.

There can be no doubt that the termination of diabetes by coma is by no means so uncommon as the comparative novelty of the subject might lead one to suppose: while the suddenness of its onset, the obscurity of its principal phenomena, and the valuable contributions which have recently been made towards their elucidation, both from a clinical and a pathological point of view, continue to render it at the present day one of the most interesting subjects of medical inquiry. Its

history may be very shortly told. Prout, Foster, and others had described rapid and sudden deaths occurring in diabetes, especially after travelling. In 1874, Kussmaul described, for the first time, the clinical features of diabetic coma, and attributed it to intoxication by acetone, which had been discovered in the blood and urine of a diabetic patient by Petters so long ago as the year 1837, and regarded by him as the cause of death. Petters's observation was confirmed not long after by Kaulich; but from that time till the appearance of Kussmaul's paper, the subject attracted no attention. Kussmaul endeavoured to support his hypothesis by experiments on animals by injecting acetone into the rectum, or under the skin, and observed that it produced intoxication, stupor, and slow respiration; but the quantity required to effect this was relatively large. He suggested that the long-continued production of acetone in the blood might induce a state of chronic poisoning, which in weak conditions of the nervous system might some time assume an acute form, just as chronic alcoholism in drunkards suddenly breaks out into delirium. But in several cases competent observers have found no acetone in the blood, and in others only faint traces; while Rupstein has maintained that free acetone does not exist in the blood, but is produced by the splitting up of ethyl-diacetic acid, thus—



One of the peculiarities of the urine in many cases of diabetic coma is the presence of a substance which gives a red coloration with ferric chloride, which so far resembles acetic ether, and does so furthermore by breaking up into acetone and alcohol. But, according to Quinke (*Berlin. Klin. Woch.*, January 5, 1880), it differs from it by the facts that urine giving this reaction does not smell of acetic ether; it cannot be extracted from it by shaking with ether; and, if present in combination with something, this was found to be neither an alkali nor grape-sugar, nor any normal constituent of urine. Experiments on animals performed by Quinke showed that they died with marked dyspnoea, but the urine in only one instance gave a reaction with ferric chloride, and the breath never smelt of acetic ether; so that, apparently, it is rapidly destroyed in the body.

A. Deichmüller (Liebig's *Annalen*, Band cex. p. 22) failed to obtain alcohol from forty litres of diabetic urine, and in a series of determinations found acetone present in quantity varying from .093 to .147 per cent. As the ferric chloride reaction points to the presence of a compound allied to ethyl-aceto-acetate, and as no alcohol was separable from the distillate, he concludes that the compound is free diacetic acid. Tollens (*Ibid.*, p. 30) confirms this, and adds that, when diabetic urine is shaken with ether, there is only a trace of the ferric chloride reaction with the ether extract; but when he added to the urine one-tenth of its volume of a one to one-half per cent. solution of ethyl-aceto-acetate, the latter was readily extracted by ether.

It seems, therefore, that there is still considerable doubt as to the chemical nature of the compounds present; and Quinke is of opinion that the toxic phenomena are not always quite identical in character, or produced by one and the same substance.

In 1877, Dr. B. W. Foster read a paper on Acetonæmia at the annual meeting of this Association at Manchester, in which he drew attention to the peculiar cream-like nature of the blood, which, under the microscope, was found to contain molecular material insoluble in ether; and having, in conjunction with Dr. Saundby, observed that acetone breaks up the blood-corpuscles so as to produce a similar molecular condition, he suggested that the state of the blood was due to the action of the acetone, and the symptoms were the result of the destruction of

the blood-corpuscles. Von Jaksch has published a similar case in which the blood-corpuscles were broken up, and the blood looked milky, although there was no fat present.

In 1879, the publication of a paper (*Edinburgh Medical Journal*, July, 1879), by the late Professor Sanders of Edinburgh and Dr. D. J. Hamilton, on a case of diabetic coma with milky blood, due to the presence of a large quantity of fat, and with fat embola in the pulmonary capillaries, opened a new line of inquiry by suggesting that the symptoms were caused by capillary embolisms of the brain and lungs.

Dr. Louis Starr (*New York Medical Record*, May 1, 1880) has described a case in which the blood was milky during life, giving rise to certain ophthalmoscopic appearances described by Dr. A. G. Heyl, and in whose lungs a few so-called fatty embola were found after death. But there was also croupous pneumonia, sufficient, in the author's opinion, to cause death.

Dr. Arthur Gamgee has published (*Physiological Chemistry*, vol. i. p. 169) the notes of a case of diabetic coma, under the care of Dr. William Roberts, in which the blood contained 13.55 parts of fat per thousand; but Dr. Dreschfeld was unable to find any embola in the lungs, kidneys, or brain. In a second case, which exhaled an intense ethereal odour, and terminated by dyspnoea and coma, the blood was found to possess, after death, the acetone-like odour, and an analysis showed it to contain only 1.88 parts of fat per thousand.

Dr. Frederick Taylor (*Guy's Hospital Reports*, vol. xxv. p. 158) says that the results of the examination of the viscera for fat embola in three cases of diabetic coma, with milky blood, were completely negative.

Dr. R. H. Fitz (*Boston Medical and Surgical Journal*, February 10, 1881) has reported a case in which a few fatty embola were found in the lungs.

In one case, published by Dr. Marshall J. Brown, a collection of small white clots filled the pulmonary artery, and these, on microscopical examination, were reported to consist wholly of fat. This sort of pulmonary infarction is different from that suggested by Sanders and Hamilton. So far, there has been very little evidence to confirm their hypothesis. It seems certain that all cases of diabetic coma have not milky blood; probably, also, all cases of milky blood are not due to the presence of fat; while there is strong evidence that, even when fat is present in large quantities, it does not always cause embola, and when it does so they appear to be neither more numerous nor better marked than may be seen in the lungs of cases of fracture which have died without having presented any special symptoms.

Besides acetone and fat in the blood, excess of sugar, and alterations in the somatic relations of the blood and the tissues, have been assigned as causes of the morbid phenomena.

Ebstein (*Deutsches Archiv*, Band xxviii.) has drawn attention to the necrosis of the renal epithelium in diabetes, which he regards as by no means unfrequent, and as a cause of the retention in the blood of these poisonous substances (acetone, sugar, etc.), which, when accumulated in sufficient quantities, give rise to dangerous and fatal symptoms; but he admits that these products might be present in quantities too great for even healthy kidneys to excrete them.

Dr. Schmitz of Neuenahr (*Berliner Klin. Wochenschr.*, January 31, 1876) has described fatty heart as an extremely common condition in diabetes, eighty out of one hundred patients presenting the objective signs of this condition, which is one that would favour the onset of the symptoms we are considering by tending to lower the blood-pressure and to impair the circulation in the brain, the lungs, and the kidneys.

Finally, Dr. Teschemacher of Neuenahr (*Berlin. Klin. Woch.*, August 1, 1881)

has recorded a case of diabetic coma, and draws attention to the resemblance of its main features to those of traumatic shock, and suggests that the cause is to be found in some lesion of the sympathetic system. According to Goltz, shock is probably due to reflex paralysis of the vaso-motor nerves, especially the splanchnics, so that the blood accumulates in the great abdominal venous trunks, and leaves the peripheral vessels and other organs bloodless.

The symptoms present in diabetic coma have been sketched by Senator (Ziemssen's *Encyclop.*, vol. xvi. p. 916) in the following words: "Sometimes suddenly, without any premonition, sometimes after a first stage of agitation, with general uneasiness, oppression, anxiety, and pain in the region of the stomach, the patient becomes somnolent, moves about restlessly, generally groaning loudly. The pulse becomes frequent; the arterial tension is low; the breathing is hastened and deep, although there is no impediment in either the upper or the lower portions of the respiratory apparatus. The extremities become cool, and even the general temperature of the body falls below the natural, and finally death ensues amidst the deepest coma, sometimes after the supervention of twitchings."

Dr. Cyr (*Archives Gén. de Méd.*, 1877, p. 691, and 1878, p. 37) says that coma is the final and most constant phenomenon, but is usually preceded by excitement and dyspnœa, more rarely by nausea and vomiting. The excitement is analogous to that seen in chloroform narcosis; the patient is a little incoherent, more vivacious than natural, and speaks rapidly; at the same time, he usually complains of *malaise*, and headache is occasionally present. This is followed by dyspnœa, which comes on generally suddenly and with violence; the inspirations are deep, both inspiration and expiration are prolonged, the air passes well into the lungs, but apparently does not oxygenate the blood. This stage may come on at once, without being preceded by excitement. The attacks of dyspnœa may recur several times, but finally the patient becomes less conscious of what is going on around him, and gradually sinks into coma, which becomes more and more profound until terminated by death. Here again, the coma may supervene suddenly, even during a period of apparent health. The length of time occupied by the stages above described has varied in the cases hitherto reported from ten or fifteen hours to three days or more, but the average has been about thirty-six hours.

Senator speaks of "twitchings" in the final stages of the coma; but at the time when Cyr wrote these had never been observed, and accordingly their absence gave to the condition a negative character, distinguishing it, for example, from uræmia. Dr. F. Taylor says that nothing like a fit has been observed in any case at Guy's Hospital; but it is certain that convulsive phenomena are sometimes present.

The premonitory symptoms, when present, are: unusual weakness or exhaustion, loss of appetite, constipation, slight drowsiness, breathlessness, headache, sleeplessness, pain in the abdomen, epigastrium, and loins. Dr. Frederick Taylor lays especial stress on pain, usually at the epigastrium and violent in character, as an early indication of the supervention of coma. No fewer than sixteen out of his forty-three cases had this symptom of pain; and he points out that, if an opiate be given to subdue it, the coma which supervenes may be wrongly attributed to the drug, either by the physician or by the patient's friends.

Professor Lépine has directed special attention (*Lyon Médical*, 1882, No. 10) to the rapid pulse as an important premonitory symptom, and states that experiments on animals with acetone or ethyl-diætic ether cause very frequent pulse, slow respiration, and lowering of the body temperature.

Diabetic coma is undoubtedly more common in the young than in persons of more advanced age. Dr. Frederick Taylor shows that, while of all cases included

in his statistics those under thirty form 45 per cent., they form $53\frac{1}{2}$ per cent. of the fatal cases, and 69 per cent. of those dying from coma. It is liable to come on at any period of the disease; but the more rapid cases—those terminating under a year—generally die of coma; and, conversely, the majority of those dying of coma are cases which have existed for less than twelve months.

Treatment, or its absence, seems to have no distinct influence upon the occurrence of this mode of death. Constipation appears, with good reason, to be thought to have something to do with it. Teschemacher's case, for instance, was constipated for five days before the outbreak of excitement amounting to mania, which preceded the fatal coma. There is a very general consensus of opinion as to the direct effects of bodily fatigue in bringing about this condition. A diabetic patient, as Prout said, lives on the brink of a precipice; and a journey to London to consult a physician, or a journey to a foreign bath in search of health, or even the more everyday occurrences of hurrying to catch a train, to escape from a shower, or too long a walk, have been followed immediately by fatal coma.

Dr. Gamgee has described a case in which recovery took place temporarily, though the symptoms returned some time after; and probably no condition can be attended by a more grave prognosis. So far, treatment seems to have been very unsuccessful. At Guy's Hospital, stimulants, either internally or subcutaneously, and the intravenous injection of saline fluids, have been attended with no encouraging success. Dr. Foster has suggested the administration of thymol or some other antiseptic, to check the formation of acetone. The indications seem to be to relieve the constipation freely and rapidly as possible, and to give diluents and stimulants by the mouth or veins.—*Brit. Med. Journ.*, May 6, 1882.

A Case of Aphasia without Lesion of the Region of Broca.

At the meeting of the Société Médicale des Hôpitaux, held July 28th, M. D'HELLY presented the brain of a woman, 24 years of age, who had died at the Beaujon Hospital. She had been suffering from pulmonary tuberculosis, and was suddenly attacked with loss of speech, without apoplexy, without disorders of sensibility or motion or of any of the special senses. She was markedly aphasic, but she did not seem to appreciate the incoherence of her speech, and showed none of the impatience usual with aphasics. She could neither read nor write; but she seemed to possess a certain degree of intelligence, and could play cards without making mistakes and could recognize money. One day she recognized a friend whom she had not seen for a long time. About three weeks later she died from the progress of her pulmonary affection.

At the autopsy the absolute integrity of Broca's convolution was established, but a large area of cortical softening was found implicating the inferior parietal lobule and a portion of the first sphenoccipital convolution; the softening was limited to the gray matter.

The fourth branch of the left sylvian artery contained a clot of the size of a small grain of shot; the other branches of the same artery were unobstructed.

The question arises, Were the disturbances of speech in this case the result of enfeebled intelligence, or of the localization of the lesion in a special region of the cerebral cortex? The latter hypothesis is much the more probable, as proved by the reports of cases under the title of *verbal* deafness and dumbness, in which interesting lesions of the sensory cortical centres have been found in physiological relation with the convolution of articulated speech.—*Gaz. Hebd. de Méd. et de Chirg.*, Aug. 4, 1882.

Painful Pressure Points.

Dr. MORITZ MEYER (*Berlin. Klin. Woch.*, No. 31, 1881) has already called attention (*Ibid.*, No. 51, 1875) to the indications for galvanic treatment obtained from the presence of painful pressure-spots along the spine. In the present paper, he restates and illustrates this point, and extends his statement to pressure-spots discoverable along the whole course of the trunks and branches of nerves.

The first case adduced is that of no less a patient than Professor Westphal himself, who, in May, 1880, had an attack of neuralgia in the right arm and shoulder. Dr. Meyer discovered a painful pressure-point at the upper part of the brachial plexus. An anode of ten cells was applied to it, and within five minutes the pain had considerably subsided. The repetition of the operation four times during the ensuing week was sufficient to effect a complete cure. In the next two cases, the result of the treatment is the more striking, that previously the patients had been subjected to galvanic treatment on the usual system.

A girl, aged 14, had for the last nine months suffered from severe pains in the fourth interosseous space of the right hand, extending upwards along the radial nerve, to the posterior edge of the deltoid. Most movements of the arm had become impossible. The galvanic current had been applied to the hand and forearm during several weeks. Dr. Meyer discovered a limited tender spot in the brachial plexus. The anode was applied over it, with the immediate result of enabling the patient to write a few words. Every successive application determined further progress; and, after the seventeenth, the patient was considered well. Subsequently, after excessive writing, there was a slight relapse, which rapidly gave way to the same treatment.

Another patient, aged 19, in consequence of an injury to the head of the ulna, for which she had worn a plaster bandage for six weeks, had, during two years, suffered from neuralgia in the ulnar nerve, which deprived her of the use of the arm. Every kind of treatment, including galvanism locally applied, had failed to give any relief. A tender spot was found at the lower part of the brachial plexus; and the treatment was accordingly conducted as in the previous case. Very soon the pain diminished, and the patient began to be able to extend and abduct the little finger. After twenty applications, she was able to paint, play the piano, etc. Writing was still difficult, and the treatment was persevered in for another series of thirty applications, when she had practically recovered.

The following cases illustrate the indicative importance of pressure-points for galvanic treatment in other neuroses.

A patient, aged 27, had suffered for nine years from sick headache. The attacks were very frequent, chiefly in the left side. There was tenderness over the upper cervical transverse processes. The positive pole, of six elements, was applied to this spot on each side, the negative under the ear of the corresponding side, for three minutes. Thirty-five such applications, spread over three months, relieved her completely. A slight relapse, after undue excitement and exertion, was overcome by a repetition of the treatment. There had been no relapse for the last four years.

A banker, aged 30, became affected with twitchings on the right side of the face. Pressure on the third and fourth cervical transverse processes was painful, and arrested the twitchings. Two courses of anodal galvanization of the spots, successfully relieved the patient, who has been free from any symptom for the last twelve months.

In a third patient, a fall down stairs, two years previously, produced injury to the right scapular region; this was followed by a neuralgic condition of the shoulder and arm, with difficulty of breathing. Dr. Meyer found the motor

points of the rhomboid (which was in a state of contraction) and the serratus magnus painful. Rapid recovery took place under galvanization of these points.

Dr. W., aged 40, after a strain six years ago, lost power in the left arm, and experienced a sense of tightness in the left side of the thorax. He had been through a number of methods of treatment, external and internal, but without benefit. Two painful points were found: one over the seventh cervical spinous process, pressure upon which caused violent hiccupping; the other over the origin of the left phrenic nerve, from the third to the fifth left transverse processes. A short galvanic treatment of nine sittings of these spots brought about a marked improvement. Nothing remained, on the patient's compulsory departure from Berlin, beyond a vague sense of discomfort. Later news from the patient showed the improvement to be lasting.

On the strength of these and many other cases, the author insists on the necessity of carefully searching in all cases of obstinate neuroses for painful spots. Weak currents are indicated especially at first.—*London Medical Record*, June 15, 1882.

On the Relations between Asthma and Mucous Polyps of the Nose.

*M. JOAL has just published in the *Archives Générales de Médecine*, an interesting article upon a point but little known, concerning the etiology of asthma. From a perusal of this article it would appear that the relations which may exist between a chronic alteration seated in the nasal fossæ and the appearance of attacks of nervous dyspnœa, as manifestations of cause and effect, have been observed or suspected by but few physicians.

The author details eleven cases, personal to himself, in which he has observed the disappearance of the asthmatic attacks immediately after removal of the polyps. These results, he argues, demonstrate the pathological rôle which must be accorded mucous polyps of the nose, in the production of attacks of dyspnœa. In some cases, the suffocative attacks disappeared, only to return as soon as the nasal respiration became affected by the renewal of the polyps.

The relation of these cases occupy the first part of the article. In the second, the author seeks the primary cause. He shows us that his patients were all of marked gouty constitution, and that the mucous polyps, which may be innocent in some individuals, play, in others, a rôle, occasional without doubt, but powerful, in the causation of nervous respiratory troubles.

The third part is devoted to the physiological pathology of the subject. The author concludes that the polyps, by their pressure, irritate the nasal mucous membrane, determining, at intervals, a reflex action, which culminates in spasm of the muscles of respiration. The author believes that as a general rule, thorough examination of the nasal fossæ should be made in all patients suffering from asthma, and presenting at the same time, evidence of pituitary troubles. If polyps exist they should be removed, preferably, by the galvano-cautery. The operation is painless, without hemorrhage, and the vegetations do not recur.

The author sums up as follows:—

1. Mucous polyps of the nose sometimes occasion dyspnœa of asthmatic character.
2. This symptom is observed chiefly in gouty subjects.
3. It is generally caused by a reflex action, consecutive to irritation of the nasal mucous membrane.
4. The excitement may originate in the sensitive filaments of the pneumogastric, which line the pharyngeal and bronchial mucous membrane.
5. Asthma may be developed by catarrhal and emphysematous lesions attributable to polyps of the nose.
6. Asthmatic symptoms disappear after removal of the polyps.

Dilatation of the Heart as the Cause of Cardiac Hæmic Murmurs.

Dr. G. W. BALFOUR has been led to adopt the theory of dilatation of the heart as the cause of cardiac, hæmic, or chlorotic murmurs, because it seems to be the only one capable of reconciling the various discrepant hypotheses regarding the origin of these murmurs.

This theory is fraught with most important instruction on the one hand, and with no less momentous warning on the other; because, if it be true, there is no longer any real distinction between functional and organic murmurs; and a murmur can only be looked upon as functional when it is found to have been curable. Moreover, if functional murmurs are really due to dilatation, as these murmurs are known to disappear—to become cured—in by far the larger number of cases, we thus obtain the important generalization that dilatation of the heart is a curable disease. The curability of such affections becomes merely a question of degree; they are more or less curable, according to the length of time they have persisted, and the extent to which the dilatation has progressed. This is the lesson with which this theory is fraught, and it involves the warning; because, if so-called functional murmurs are due to dilatation, and dilatation becomes incurable by persistence and extension, it is surely a most important matter that we should all take care that none of our cases of functional disease become organic by neglect.

Dr. Balfour has adopted the theory of cardiac dilatation as the cause of cardiac hæmic murmurs for three reasons: first, because it alone is capable of explaining rationally all the discrepancies in the prevalent theories of these murmurs; second, because it is thoroughly consistent with the results obtained by experiment; and third, because it is perfectly consonant with clinical experience.—*Brit. Med. Journal*, Aug. 26, 1882.

Syphilitic Myocarditis.

Dr. MANNINO, of Palermo, reports the following case, in which syphilitic disease of the heart was diagnosed during life (*Giorn. Ital. delle Mal. Ven. e della Pelle*, Dec. 1881). A man, aged 36, was admitted into hospital, under the care of Dr. Federici, on Feb. 15, 1880. The patient stated that he had always enjoyed good health until eight years previously, when he contracted some venereal affection, which was followed by pains all over the body. He took iodide of potassium for a month, and was then able to resume his work; but since that time he had suffered every autumn and winter from a pustular eruption on the legs. With this exception his general health had been good, until a few months before his admission, when he began to suffer from occasional difficulty of breathing. The attacks of dyspnoea gradually increased in severity; a troublesome cough appeared; and finally the patient became unable to work, and applied for admission into the hospital. On admission, the man was in a very weak state, his chief complaint being of difficulty of breathing. Cough was troublesome; the belly was swollen; both legs were œdematous and covered with coppery stains, scaly patches, pustules, and ulcers, which were considered to be of a syphilitic nature. Several groups of lymphatic glands were enlarged. The cheeks, lips, and nose were blue; the great veins of the neck were prominent and turgid, while pulsation in the arteries was very weak. The skin of the trunk and neck had a mottled appearance, and the pulse was imperceptible at the wrist. The hands were cold. The heart's impulse was diffused, and pulsation was also visible in the epigastrium to the left of the sternal line. The exact situation of the apex-beat could not be defined, but the area of cardiac dulness was normal, the lowest limit being the fifth intercostal space. At the apex the first sound was

obscure, and accompanied by a very faint blowing murmur. At the base, and in the second right intercostal space, the *bruit* was somewhat louder; but was much more distinctly heard in the epigastrium than elsewhere. The diastole was weak, but clear. The percussion sound was normal over the front of the chest; the posterior thoracic parietes were œdematous. The respiratory sounds were normal, except in a few places where slight mucous *râles* were audible. The area of dulness of the liver and spleen was somewhat increased. The urine was scanty, acid, specific gravity 1025, and contained traces of albumen. From these various signs, Dr. Federici diagnosed that the muscular structure of the right side of the heart was chiefly at fault, and that the disease was probably of a syphilitic nature. In spite of hypodermic injections of mercury, and large doses of iodide of potassium, the attacks of dyspnœa became more and more severe, especially at night; but the patient slept fairly well in a semi-erect position. The pulse was regular and about normal as regards frequency; but pulsation could never be felt in the radials, and even in the larger vessels, such as the femoral, was very weak indeed. The respiration was always accelerated (sometimes thirty per minute), and chiefly abdominal in character. The temperature was usually below normal. During the next few days the *bruit* gradually became fainter and fainter; but was always heard best at the epigastrium. The sputa became bloody, the dyspnœa more and more urgent, until, finally, the patient died rather suddenly, soon after a meal, nine days after his admission into the hospital. *Post mortem*, the pericardium contained about 3 ounces of clear serum. The heart was globular in form, and weighed nearly 14 ounces, the enlargement being due more to the left than the right ventricle. On the anterior surface of the right ventricle was a patch of fibrous induration, 8 centimetres long and 3 centimetres broad. On the left ventricle was a similar patch, of the size of a five-franc piece; and other smaller indurated patches were scattered over the surface. A hard fibrous cord, studded with nodules, followed the direction of the interventricular septum. All these parts were pale in colour, resisted the knife, and creaked on section. The tricuspid valve was healthy, with the exception of a slight enlargement on one of the cusps. The endocardium was opaque in patches. The left ventricle was considerably dilated, and the endocardium of the conus arteriosus was white, hard, and glistening, like cartilage. The muscoli papillares of both ventricles were pale and shrunken. Under the microscope, the affected portions of the muscular substance showed the usual appearances of syphilitic myositis. The lungs were adherent in some places, emphysematous in others, and contained numerous infarcts. The liver showed a patch of syphilitic interstitial hepatitis in an early stage. The spleen was enlarged and rather hard, its capsule being opaque and partially adherent to the thoracic wall. The kidneys were much congested. The other organs of the body, as well as the larger bloodvessels, were healthy.—*London Med. Record*, June 15, 1882.

Tuberculosis of the Thoracic Duct.

The larger lymphatic vessels obtain far less attention at the present day from pathological anatomists than they received a hundred years ago. This is doubtless in part due to changes in current theories of disease, which ascribe to the lymphatics a smaller share in pathological processes than did the doctrines of an earlier day. Of late attention has been to a considerable extent diverted from the larger trunks to the minute lymphatic vessels. A few years ago, however, some observations by Ponfick on tuberculosis of the thoracic duct directed the notice of pathologists to one part of the subject, and some interesting observations on the same lesion have been published in a recent number of Virchow's *Archiv*,

by Dr. STILLING, of Strassburg. The thoracic duct, when thus affected, is usually enlarged throughout its extent to about three times its normal size. It can only be separated with difficulty from the adjacent connective tissue, and the vessels of the adventitia are usually conspicuously distended. The lymph contained in it is of a red colour, and often mixed with coagula. The inner surface of the duct presents innumerable miliary tubercles, most of them transparent, but some opaque. There are also other nodules of greater prominence, which considerably narrow the lumen of the duct, especially at the position of the valves, which are very liable to be affected. The masses are opaque, yellowish-white, and irregularly fissured. At an early stage they are found only at certain spots, especially on the valves, and at the mouth of tributary vessels. In two cases Stilling found the change limited to a small area of the duct: in one, only half an inch near the opening into the subclavian vein being affected; in the other, about an inch and a half of the duct above the diaphragm. The small prominences were found to consist of densely massed cellular elements, which had the appearance either of leucocytes or of larger epithelial-like structures. The latter were situated chiefly at the bases of the tubercles; there was also a cellular infiltration of the adjacent vessels. In their further growth the tubercles present metamorphoses characterized by increasing indistinctness of the central cells, which become blended into a homogenous mass, while in the periphery new corpuscles accumulate and fresh fibrin is deposited. Neighbouring prominences unite, and the hyaline substance becomes fissured, and thus the so-called "tubercular ulcers" are formed. Of a considerable number of bodies in which the condition of the thoracic duct was carefully examined, this tubercular change was met with in six only. Of the cases examined, eighteen died from acute tuberculosis, and these furnished five of the cases of duct affection; in all the cases the abdominal organs were extensively infiltrated. A remarkable fact is that most of the patients were comparatively advanced in life, the youngest was in his thirty-eighth year, and others were forty-five, fifty-seven, sixty-five, and sixty-nine years old. In only two cases were old caseous accumulations found, such as may, on Buhl's theory, have served as a point of infection; in one there was a right-sided caseous pyelo-nephritis, and caseous spots in the testicles and suprarenal bodies. In the other cases there was old tubercular mischief in the lungs and in the ileum. The structure of the new growth in the thoracic duct is certainly not that which has been described as present in the tubercular formations in vessels. Hence Stilling thinks that the small prominences ought to be regarded as merely thrombotic deposits, and that the larger deposits should be spoken of, according to the degree of cellular infiltration of the wall of the vessels, as either thrombosis or inflammation of the thoracic duct. The isolated occurrence of giant cells in thrombi, or in the inflamed wall of the vessel, does not, he thinks, invalidate this conclusion, since they may occur as a result of endothelial overgrowth, even in the thrombi which are formed in ligatured vessels. Nevertheless, although the histological structure is not characteristic of tubercle, it is clear that the disease is intimately associated with true tubercle, and its whole history is most clearly comprehended in the conception of an actual tuberculosis of the large lymphatic vessels. Old handbooks of medicine often allude to the occlusion of the duct by a caseous material, and to its inflammation, and the stages of the disease were described with considerable accuracy by Gendrin in 1826, but the condition was not distinguished from cancerous occlusion. The first really exact description was given by Astley Cooper in 1798.—*Lancet*, June 10, 1882.

Contraction of the Kidney.

Professor BIERMER (*Breslauer Ärztlich Zeitsch.*, 1882, No. 1) points out that until 1853, when Dr. Wilks first showed that there existed a form of Bright's disease unattended by dropsy, the opinion of the German medical clinical teachers always held the contracted kidney to be the final stage of ordinary parenchymatous nephritis. That it may occasionally be seen in such cases is possible, although it is rare for patients to survive the effects of the processes which lead to its formation. Following Dr. Traube and Dr. George Johnson, Dr. Biermer insists, from a purely clinical point of view, upon the existence of a special form of renal inflammation, which may be properly described as genuine contraction of the kidney. The course and sequence of symptoms in such cases are too typical for them to be denied a special category. Beginning, without special cause, with polyuria and small quantities of albumen in urine of low specific gravity, a gradual but progressive wasting ensues, the complexion becomes sallow, the left ventricle of the heart becomes hypertrophied, the tension of the pulse becomes increased, dyspnea follows, and disturbances of digestion or of vision take place, without a trace of dropsy having been observed. In the latter stages the evidences of uræmia are the chief symptoms which may culminate in death.

It is hardly possible to believe that cases running such a course could have begun with parenchymatous nephritis; and hence, Dr. Biermer holds that the process from its commencement must have been a different one. He suggests that no special etiology can be associated with this form of disease. In none of his cases does he find any exciting cause except chills, and upon the importance of these he lays some stress.

Repeated chills and complaints of cold feet are common before the disease is recognizably established; and from this fact he is inclined to ascribe a good deal of the disease to exposure of the extremities in cold, underground dwellings, damp floors, etc., recognizing in the polyuria of the initial stages the agency of arterial congestion within the kidney, induced by these means. He points out, in passing, that the very occurrence of increased instead of diminished secretion of urine proves that the early affection of the kidney is not obstructive in its nature, *i. e.*, causes no narrowing of the lesser tubules.

In the latter stages three influences may be recognized as playing a part in the destructive processes in the walls of the vessels—the mechanical influence of the frequently increased tension within the vessel, the degenerative influence of frequent congestion, and the more subtle influence of impaired nutrition. To the second of these, *viz.*, frequent congestion, one must look for the explanation of the occasional excess of albumen thrown off.

The form of contracted kidney described in association with atheroma of the arteries differs in many points from this genuine idiopathic nephritis atrophicans. In the atheromatous form the symptoms of changes in the heart and arteries appear long before the albuminuria and the signs of renal contraction. In the genuine contracted kidney this order is exactly reversed. Histologically, also, there is a difference, the contracted kidney showing a marked overgrowth of connective tissue, the atheromatous form being simply atrophied, with certain epithelial changes. Two other forms of contracted kidney may be recognized, *viz.*, the contraction after parenchymatous nephritis, or the amyloid state, and the gouty kidney. The first of these, with or without amyloid change, is rarely seen. The gouty kidney, besides its diathetic origin, shows changes which are more purely atrophic, and often cystic or pyelitic. In its early stages, moreover, its symptoms are quite distinct, although less easily distinguished towards the close.

The course of a genuine contracted kidney is from the beginning insidious and chronic. The earlier stages have been already mentioned. The later stages may be divided into two periods—one, in which the concurrent hypertrophy of the heart maintains a sufficient compensation, and the other, in which it ceases to compensate properly, and in which the symptoms of uræmic poisoning are most prominent. Complications such as apoplexy, pneumonia, erysipelas, etc., are frequent; but where none such occur, contraction may go on to an astounding extent.

Of the individual symptoms the state of the urine is the most important. The proof of the presence of albumen in the urine is indispensable; but it must be remembered that the amount often varies greatly, and that it may sometimes be altogether absent for a short time. Bodily exercise and muscular effort favour the production of albuminuria, and Biermer has often produced it in suspected cases by these means. Microscopic examination generally shows a scarcity of solid elements, a few isolated hyaline cylinders, and, at times, a little renal epithelium, but rarely any blood-corpuscles. The excessive secretion of urine is not accompanied by thirst.

The condition of the heart, of the arteries, and of the fundus oculi, are of decided importance in diagnosis; though neither of them, taken alone, is essential. A certain amount of hypertrophy of the left ventricle is almost always present, and high tension is maintained in the arteries, even, as some English observers have shown, during the diastole in extreme cases. Palpitation is frequently complained of; retinal changes may or may not be present, and are very variable in their extent and severity. Disturbance of respiration is always present; dyspnoea is frequently the first subjective complaint. In the earlier stages it is probably due to cardiac derangement, but later on the cause is generally uræmic. Occurring frequently in cases with pulmonary complications, its importance as diagnostic of renal disease may be overlooked. Cerebral symptoms are not usually present till the late uræmic stages; early uræmic states may show themselves in headache, vomiting, etc.

Disturbance of digestion is sure to appear sooner or later. The general nutrition is always affected; indeed, it is never properly maintained in the presence of chronic renal disease. This fact serves to distinguish the organic renal mischief from the functional and innocuous albuminuria which has been described of late years. If any person have albuminuria for several months, and do not lose flesh, he certainly does not suffer from contracted kidney. Dropsy plays a negative part, and, if present to any extent, must be due to one of the other forms of chronic renal disease, and not to genuine contracted kidney.

Biermer closes his remarks with the statement that he knows of no effectual means of treatment for this disease. He speaks strongly as to the danger of checking the diuresis, and hence finds all astringents to be contra-indicated. Even tannin, which he would employ in parenchymatous nephritis, he objects to in this form of disease. Diuretics and tonics are to be used until the uræmic state is arrived at; and during that period only narcotics, as morphia and chloral, should be given, simply with a view to the temporary relief of the strugglings and sufferings of the patient.—*London Med. Rec.*, June 15, 1882.

Polyuria and its Treatment by Pilocarpine.

Dr. DUCROUX, in an essay on this subject (Paris, 1882) points out that polyuria may constitute an essential affection, with more or less abundant elimination of urea, oxalates, and phosphates, or may be only the symptom of another disease, interstitial nephritis, diabetes mellitus, or cerebral hemorrhage. Essential polyuria is principally met with in adolescence and childhood; in old age, sympto-

matic polyuria is more often met with. It is especially in children and adults that the former shows itself, because at that age the nervous condition predominates, which, according to Lecorché, is one of the predisposing causes, in the same way as are scrofula, alcoholism; syphilis, arthritis, hysteria, and heredity. Other causes which have been pointed out are chills, mental disturbances, grief and fatigue. In chronic polyuria, the quantity of urine may rise to 35 or 50 pints in a day. The progress of this affection is variable. It may be acute and cease spontaneously, or it may pass into the chronic state and be of life-long duration. Examination of the urine is the only means of ascertaining whether the case be one of simple azoturic, phosphaturic, or oxaluric polyuria, or if the patient be suffering from diabetes mellitus or from nephritis. The diagnosis from interstitial nephritis sometimes presents great difficulties. Since, in polyuria, the functions of the skin are generally very badly performed in consequence of the disturbance of the balance between the sudorific and renal secretions, it was natural to think that jaborandi, and especially its alkaloid pilocarpine, as a consequence of their sudorific action, would diminish the amount of urine in simple polyuria, and consequently lower the amount of urea eliminated in azoturic polyuria. M. Albert Robin has, in fact, already pointed out that urea always decreases in the urine under the use of jaborandi or its alkaloid, and that this decrease oscillates between about $7\frac{1}{2}$ and 150 grains; after the action of the drug, the urea regains its normal standard. It now remains to analyze the sweat, and to find if the urea, the salts, and extractive matters, which, under the influence of the drug, are eliminated in a smaller quantity by the urine, are not found in more than normal quantity in the perspiration. The sweat obtained by administration of pilocarpine contains according to M. Albert Robin, from 50 centigrammes to 2.9 grammes of urea per litre, instead of 40 centigrammes, stated by Favre to be the amount for normal sweat. It likewise contains an excess of chlorides. M. Huchard, at the commencement of last year, first used pilocarpine in polyuria, and it was in his wards at the Tenon Hospital that M. Ducroux collected the seven cases published in his thesis. M. Huchard employed nitrate of pilocarpine in hypodermic injections of from one to two centigrammes (0.15 to 0.3 grain). A daily injection was given during from three to five consecutive days; then they were suspended during the same interval of time, and again continued in the same fashion. In certain diseases the medication was of necessity suspended for a longer time, in consequence of the fatigue produced. At other times these intervals, though necessary, were very irregular. The appetite was generally not so good during the whole course of the treatment; but no patients lost flesh. The results of this new medication, summarized from the author's seven instances, are as follows: Pilocarpine brought on complete cure in two cases of azoturic polyuria, one essential, the other symptomatic of nephritis. In the latter case, it even led to the disappearance of a very marked amblyopia. In two cases of simple polyuria; it brought on a decrease of the quantity of urine, and a decided improvement in the general symptoms. It was powerless in a case of saturnine polyuria, in one of chronic essential polyuria of long standing, and in one of scrofulous polyuria with cachexia, in which the patient could not tolerate it. These cases are not as yet sufficiently numerous to exactly indicate those forms of polyuria in which it is advisable to use pilocarpine; but it is now well established that this troublesome affection is often influenced in the happiest manner, or even cured, by this treatment. M. Ducroux records that M. Huchard has tried pilocarpine in doses of five milligrammes (0.75 grain) at night for the nocturnal sweats of phthisical patients, and has often seen them decrease, or even completely disappear, after having resisted atropine. Relapses occurred, but they also happen with other forms of treatment.—*London Med. Rec.*, June 15, 1882.

Diagnosis of Abdominal Tumours.

Lo Spallanzani has recently published a lecture under the name of Prof. BACCELLI on the diagnosis of tumours of the abdomen. We give the following *résumé* of the principal diagnostic points:—

Before all, it must be determined whether the tumour is situated within or external to the peritoneal cavity. Extraperitoneal tumours are distinguished by a clear and tympanitic resonance due to the presence of the intestinal mass behind them; it should, however, be remembered that this sign may fail when the intestines are filled with feces, when there is a concomitant ascites, when the tumour attains such a size that it presses on all parts of the abdominal walls, or when the tumour is in contact with some voluminous intraperitoneal organ, such as the liver.

On the other hand, the tympanitic note may be present in the case of tumours of the liver or spleen, if they are covered by intestinal loops.

Observation of the movements of the tumour during inspiration and expiration may give very precise information.

Thus, the intraperitoneal tumour is depressed in inspiration and elevated in expiration. Retroperitoneal tumours, if exploration by the touch is possible, seem to slip under the hand.

Tumours of the abdominal walls, on the other hand, are elevated and depressed in a line perpendicular to the axis of the body, because in inspiration the distance between the anterior and posterior walls of the abdomen is increased. An intraperitoneal tumour, however, may remain immovable if it has formed adhesions to the anterior abdominal wall or with the pelvis, or if the diaphragm or lungs are inactive.

A retroperitoneal tumour can also be movable if displaced, as a floating kidney; or if it is adherent to an intraperitoneal organ.

Backward movements of the tumour will be prevented by adhesions to the anterior abdominal wall. If the tumour is small and slightly movable, or independent of the respiratory movements, its change of position can be readily recognized from the exterior.

It is indispensable to study the tumour in connection with the region in which it is found; thus, it is known that the kidney may be displaced in front of the liver and so simulate a hepatic tumour. So also a pleural exudation may be mistaken for hypertrophy of the liver.

Tumours of the epigastrium may depend upon the stomach, peritoneal exudation consecutive to some ulcerative process, or upon echinococcus or cancer of the left lobe of the liver.

Tumours of the umbilical region, when not implicating the organs normally in this region, may depend upon a depressed pylorus, on a displaced spleen or kidney, or on a urinary calculus closed in the urachus.

Tumours of the hypogastric region may be caused by the distended bladder, the gravid uterus, ovarian or uterine tumours, or encysted exudations.

Tumours of the iliac and inguinal fossæ can be produced by fecal matter in the cæcum, by neoplasms of the intestine, by abscess, local peritonitis, or affections of the vermiform appendix.

It is also necessary to examine the form of the abdomen to see whether the normal outline has been departed from.

Splenic tumours, in elevating the costal arcs, raise the abdominal walls and give the abdomen a pyriform appearance, with the point directed towards the pubis.

Tumours of the kidney, on the other hand, pressing on the ribs, give the abdomen a very irregular outline.

In the case of tumours of the hypochondrium the umbilicus approaches the pubis and is elongated.

In tumours which are developed deep in the abdomen the umbilicus may be slightly depressed and stretched laterally, and the median raphé slightly deviated to the side on which the tumour is present.

The dilatation of the peri umbilical veins, the so-called *head of Medusa*, is a sign of obstructed circulation of the portal vein, and is very well marked in central tumours of the liver.

The other dilatations of the epigastric veins indicate interference with the circulation in the inferior vena cava, although obstructed portal circulation may also cause them. It is also necessary to consider displacements of other organs.

In tumours of the spleen the cardiac ventricles maintain their normal position; in tumours of the kidney the stomach is completely displaced; and in large tumours the stomach may form an arc of a circle, its concavity corresponding to the convexity of the internal border of the tumour.

In tumours of the kidney the colon preserves its anatomical position; but when the tumours are very large it may be pushed behind or flattened.

The lower limit of the thoracic cavity must be always accurately limited by percussion, as in tumours of the hypochondrium, which cause tension on the diaphragm, the complementary pleural angle nearly always disappears. This is also usually the case in tumours of the kidney.

It is also to be noticed that in movable kidneys, in the standing position or even in the dorsal decubitus, a hollow can be observed in the corresponding lumbar region, and the kidney cannot be felt by palpation.—*L' Abeille Méd.*, July 3, 1882.

SURGERY.

Thyrotomy for Removal of Foreign Bodies Impacted in the Interior of the Thyroid Cartilage.

At a late meeting of the Royal Medical and Chirurgical Society Mr. T. HOLMES read a paper on this subject. The history of a case was related in which a large and rough piece of rabbit-bone was impacted in the neighbourhood of the left vocal cord for seven days before its removal. On the failure of attempts to extract it with the laryngeal forceps from the mouth, laryngo-tracheotomy was performed on the fifth day; and as the bone was still immovable, the thyroid cartilage was divided on the seventh day, when the piece of bone was at once extracted. The patient had suffered rather severely from inflammation of the mucous membrane of the larynx and trachea before the operation, and this did not subside after the operation, but spread gradually down to the lungs, until finally a gangrenous abscess formed in one lung, and the patient died nine weeks after the operation. Post-mortem examination showed evidences of intemperate habits, which were, indeed, also known from the patient's history. The voice had almost entirely returned before the patient's death, and the wound had contracted to a very minute fistula. The parts concerned in the operation were exhibited, and showed hardly any unnatural appearances. There was slight ulceration of the left vocal cord, caused by the foreign body, and a very minute perforation still existing in the thyroid cartilage above the glottis; but the wound, which extended from the upper border of the pomum Adami to the second or

third ring of the trachea, was represented only by a faint line of union, and the vocal cords showed no sign whatever of having been interfered with.

The general subject of the indications for thyrotomy, the method of performing it, and its results, in cases of impacted foreign bodies, was discussed, and the following conclusions were arrived at : 1. Very large substances may be impacted, either in the ventricle or between the alæ of the thyroid cartilage, without causing any symptoms of immediate urgency. 2. When such substances are rough or pointed they sometimes give rise to a spreading inflammation of the mucous membrane, and in such cases should be removed as soon as possible. 3. If they can be seen and touched they can usually be removed from the mouth, either whole or piecemeal. 4. When this is found impossible without tracheotomy, an opening should be made through the crico-thyroid membrane and upper rings of the trachea. 5. After this operation it is quite possible that the spasmodic condition of the parts about the glottis may subside, and a renewed attempt at extraction be successful. 6. If this is impossible the foreign body may perhaps be either extracted or displaced from the tracheal wound, so that a preliminary tracheotomy is always advisable. 7. On the failure of such attempts the thyroid cartilage is to be laid open in the middle line—partially from below upwards if the body is small and can be felt lying near the wound; entirely and from above downwards if the body is large, firmly impacted, and lying out of reach from the tracheotomy wound. 8. The operation of thyrotomy involves little danger to life and not much to the integrity of the voice: at least, the risk of damage to the vocal cords is much greater from the protracted irritation of the foreign body than from the operation.

Mr. DURHAM had opened the larynx in two cases of impaction of foreign bodies; in both cases recovery followed. The first was that of a cherry-stone, which could not have been removed by the larynx; it was fixed between the true and false vocal cords, and enveloped in swollen tissue. In the second case the foreign body was a bone, which at first caused much dyspnoea, but this soon subsided; it could be seen by the laryngoscope, but was involved in much œdema. When the thyroid was opened the bone was found to be tightly wedged in. Thyrotomy was sometimes the best operation, but not always; it should only be employed when endo-laryngeal operations failed. The deaths after it had been due to disease, not to thyrotomy. He did not like the term thyrotomy, as other structures than the thyroid cartilage were cut.

Mr. CROFT had successfully performed this operation once on a patient who had been in the hospital for three weeks, so that he did not think that the interval between impaction and operation could have been the cause of death in Mr. Holmes's case. The foreign body was a walnut-shell. Perhaps the abscess in the lung in Mr. Holmes's case might have been due to blood inhaled during the operation.

Mr. HOWARD MARSH mentioned the case of a child, where, after tracheotomy, he had been unable to remove the tube. He opened the larynx with no detriment to the child.

Dr. SEMON said that in some cases bad results were traced to the operation, which were really due to the presence of the foreign body. Thus, in Mr. Croft's case, the left thyroid was ankylosed and the right arytenoid dislocated—all evidently due to the effects of the foreign body.

Mr. HOLMES said that in his case the foreign body was very large—much larger than appeared by the laryngoscope,—so that it would have been quite impossible to remove it by the mouth. He thought death was due to inflammation which had begun in or around the trachea, and thence gradually spread downwards. The abscess was not caused by any accumulation of blood. He likewise

thought that many of the evil results which had followed the operation were due to the foreign body, and not to the operation itself. In this case there was little or no deformity after operation, the vocal cords were in their normal relations, and the wound was hardly perceptible on the inner side of the larynx.—*Med. Times and Gazette*, June 3, 1882.

Laryngeal Cysts.

From an elaborate study of this subject, Dr. CERVESATO draws the following conclusions:—

1. Laryngeal cysts originate from the retention of the secretion of mucous glands.
2. They are rarely of a different nature or combined with other tumours.
3. They are not so rare and exceptional as has hitherto been stated.
4. The condition usually favouring their development is chronic pharyngo-laryngeal catarrh.
5. Their favourite seats are the epiglottis and the vocal bands.
6. The larger-sized cysts occur at the anterior surface of the epiglottis and in the glosso-epiglottic sinuses.
7. These can easily be mistaken for hygroma of the hyo-epiglottic bursæ mucosæ.
8. Causes leading to chronic pharyngo-laryngeal catarrh indirectly produce laryngeal cyst.
9. Laryngeal cysts are more frequent in males and in adults.
10. Their symptoms are those of other laryngeal tumours, varying according to seat and size; as a rule they are mild.
11. Their diagnosis is assisted by the observation of the functional disturbances, but rest on laryngoscopic examination alone.
12. In some cases of epiglottic cyst manual exploration may assist the laryngoscope.
13. Laryngeal cysts not infrequently disappear spontaneously.
14. The prognosis is always favourable.
15. The treatment consists in emptying the cyst, and preventing recurrence, always through the *vias naturales*.—*Archives of Laryngology*, April, 1882.

Resection of the Stomach.

Until now Billroth has made three resections of the stomach. At the meeting of German surgeons, Mickulicz presented the specimens of the excised tumours and made some remarks as to the technique of the operation.

The first operation was by M. Hiller, on a woman aged 43 years, the only person who until now survives the operation; the operation was performed on Jan. 29, 1881, and lasted one hour and a half: 56 sutures were placed in the stomach. The abdominal wound healed in six days, and the patient left the hospital in four weeks. The portion of the stomach which was excised was taken from the greater curvature, and was 14 centimetres long; it was infiltrated with colloid carcinoma, and produced obstruction of the pylorus.

The second patient, a woman of 39 years, was operated on on Feb. 28, 1881: the operation lasted nearly three hours, and was very difficult, on account of the tumour having ulcerated and caused perforation of the stomach and adherence of the growth at the abdominal walls; the excised portion was ten centimetres long; 58 sutures were employed; the patient was apparently dying from exhaustion from vomiting on the third day. From the constant vomiting Billroth concluded that the stomach and duodenum were still adherent to the abdominal

walls, and so prevented peristaltic motion; he therefore made a duodenal fistula, through which he attempted to nourish the patient. The attempt was not successful, and the patient died, 30 hours afterwards, without symptoms of peritonitis.

The third operation was done on a woman aged 38 years, in the middle of last March, and lasted two hours: the case was one of medullary cancer, which had contracted adhesions to the pancreas; 56 sutures were placed in the stomach; the woman died ten hours afterwards.

Concerning the method of operation, Mickulicz made the following remarks:—

1. The stomach must be well washed out before the operation, and when the dilatation is pronounced it should also be washed out on the evening before the operation.

2. The transverse incision seems to be the best for opening the abdominal cavity, as it gives more room and heals equally well with incisions made along the linea alba. The incision should be made over the more prominent point of the tumour.

3. The greatest care should be employed in detaching the stomach from the greater and lesser mesentery; this should be done as in an ovariectomy by isolating small fragments and then passing the ligatures before separation. Billroth also used hæmostatic forceps so as to avoid the loss of blood.

4. It does not appear necessary to close the stomach, after the opening has been made, by Wehr's compressors, as if care is taken to have the stomach well washed out, no escape of contents is to be feared.

5. In the case which was cured, Billroth sutured the duodenum to the lesser curvature and closed the gastric orifice by transverse sutures. The second case was operated on in the same manner; in the third he fixed the duodenum to the greater curvature, as he thought that then there would be less traction exerted on the stomach.

6. For the sutures of the stomach, Billroth employs silk thread.—*Journ. de Méd. de Paris*, Aug. 5, 1882.

Dr. C. MAX RICHTER reports the following case in which he performed resection of the pylorus in a man aged 51 for carcinoma. When he examined the patient he found a tumour of the size of a small apple in the region of the pylorus, and the stomach greatly dilated by air. The tumour changed its position, and was found nearer the left side after the patient had vomited.

A transverse incision was made, about five inches long, and about one inch above the umbilicus, through the integuments of the abdomen. After bleeding was stopped, which was rather excessive and required about a dozen silk ligatures, the peritoneum was opened, and the tumour of the pylorus brought to view. It appeared to be three times as large as it was supposed to be from the examination external, having the size of a small orange; and, furthermore, it was found to extend along the small curvature nearly to the cardiac portion of the stomach. To make this part of the cancer accessible, the outer wound had to be widened by an incision in the middle line to the end of the processus xiphoideus. The isolating of the tumour was proceeded with by ligating the large omentum, which contained three swollen glands. Double ligatures of No. 7 twisted silk were applied, and an attempt made to sever the tissue between, by galvano-cautery. This was abandoned as some bleeding followed. Scissors were resorted to, and the tumour was soon isolated along the large curvature. The same was done along the small curvature, and after the tumour was perfectly isolated, an oblique incision was made through the stomach, corresponding to the extensions of the cancer along the small curvature. Some bleeding followed, and about eight silk ligatures were applied. The walls of the abdomen

were considerably thickened, and inside the stomach, which was dilated to about double its volume, more débris was found. The stomach was cleaned then with soft sponges, and the first incision closed by about twenty silk ligatures, after Czerny's method. The silk was No. 1 English twisted, and the finest eye-needles were used. This material, however, proved to be inadequate, owing to the thickness of the coat of the stomach, and larger sewing needles and No. 3 twisted silk were substituted. The stomach was then cut through toward the large curvature by an incision parallel to the pylorus, the stomach and the abdomen being fixed by the hands of two assistants. At this point of the operation the patient collapsed. He stopped breathing, and was soon afterwards almost pulseless. Two hypodermic injections of twenty minims of tinc. moschi each, were given to him, and followed at the end of the operation by several syringefuls of brandy. The operation was not interrupted. The tumour was severed from the duodenum by an incision perpendicular to the axis of its length. About a dozen ligatures were applied to the bloodvessels, on both incisions, and then—all with the greatest possible haste—stomach and abdomen united, the posterior after Woelfler's method, and the anterior after Czerny's. After cleaning the new-built stomach and the tissues about it, the outside wound was united by No. 7 silk sutures, and Lister's dressing applied. The abdomen was also covered with a third layer of salicylated cotton, both to disinfect and keep the abdomen warm.

The operation had lasted two hours and twenty minutes. The patient had, in the mean time, somewhat recovered; his pulse was nearly as good as before the operation, and he was soon made comfortable on his bed, which had been thoroughly heated. He woke up and complained about difficulty in breathing. Every fifteen minutes a hypodermic injection of a syringeful of brandy was applied, and every two hours an injection of more brandy, with corn-starch, into the rectum. Three hours after the operation, however, the patient died, gradually failing. The autopsy could not be made, as the body was removed the same afternoon, and taken to Sonoma.—*San Francisco Western Lancet*, July, 1882.

Dr. E. J. KUHN, of Heidelberg, reports in von Langenbeck's *Archiv*, Band xxvii. Heft 4, a case of malignant disease of the pylorus, in which resection was successfully performed by Professor Czerny. The subject of this case was a man, aged 28, who, for ten weeks before admission into hospital, had suffered from pain in the epigastrium, and abdominal distension after every meal, and for six weeks had constantly vomited sour and ill-smelling fluid, about two hours after having taken food. When first seen by Professor Czerny, the patient was much emaciated, and the stomach was found to be much distended, and reached almost as far as the symphysis pubis. In the region of the pylorus could be felt a hard and movable tumour, smooth at its surface, and tender on pressure. After frequently repeated injections into the stomach of a solution of salicylic acid, the operation for the removal of the diseased polypus was performed, with antiseptic precautions, about five weeks after the date of the patient's admission. The tumour having been exposed by an incision, four inches in length, made in the middle line of the anterior abdominal wall, and passing through the navel, the greater and lesser omentum were carefully detached, and all bleeding vessels secured. On incision of the anterior wall of the stomach at its pyloric extremity, the swelling was found to consist not of one tumour, but of several large, warty, but not ulcerated, nodules on the inner surface of the pylorus, the coats of which were uniformly thickened, so that a considerable degree of stenosis had been established. The diseased pylorus was then separated by scissors, first from the stomach, and afterwards from the duodenum, the two openings of the divided intestinal canal being closed by the fingers of an assistant,

and by Nélaton's forceps. The edges of the gastric and duodenal orifices were brought into contact by closely applied catgut sutures. The operation lasted during two hours and a quarter. The isolation of the diseased portion of the pylorus was, it is stated, attended with some difficulty, and, during the dissection, there was bleeding from a number of small vessels. During the operation, forty-eight ligatures were applied; eight to the edges of the wound through the abdominal wall, and forty to the divided intraperitoneal vessels. The diseased structures presented, on microscopic examination, the characters of colloid carcinoma. The patient recovered without the appearance of febrile or other unfavourable symptoms. During the after-treatment, he remained free from vomiting and tenderness in the abdomen. Solid food was taken on the fifth day, and, at the end of the third week, the patient was able to leave his bed. The weight of the body was increased by eleven pounds in the course of the first five weeks after the operation, and by twenty-nine pounds in four months. When last seen, after an interval of five months, the patient was in good health.—*London Med. Record*, Aug. 15, 1882.

Colectomy.

Mr. JOHN MARSHALL reports in the *Lancet* for May 6, a case of colectomy, in which he operated with unsuccessful result.

Mr. Marshall gives an interesting historical *résumé* of this operation with notes of the six preceding cases, viz.: those of Reybard of Lyons,¹ Gussenbauer of Liège,² Baum of Dantzie,³ Martini of Hamburg,⁴ Czerny of Heidelberg,⁵ and Bryant of London.⁶

Mr. Marshall concludes from a review of this case, with six others, that the operation of colectomy is one not to be lightly undertaken; but it may nevertheless be predicted of it that it will take a place in surgery. Of the seven cases at present recorded (if we include Reybard's operation), four—namely, Reybard's, Martini's, Czerny's, and Bryant's—may claim to have prolonged life for many months; whilst three—namely, Gussenbauer's, Baum's, and his own—proved fatal in fifteen hours, on the ninth day, and on the third day after the operation.

In all seven operations, the mode of excising the diseased bowel and its mesocolic attachments was almost identical; but, in other respects, they differ considerably. Thus, in the four successful cases, only one incision was made into the abdominal cavity; in two out of three of the unsuccessful cases, two such incisions were made, and in the other a very large T-shaped wound was inflicted. Again, in three of the four successful cases, Reybard's, Martini's, and Czerny's, a tumour was detected before the operation; whilst in the other, Bryant's, it was not, though at the same time there were indications of the obstruction being situated in the lower part of the colon. In two out of the three early fatal cases, Gussenbauer's and Baum's, the tumour was evident; in the other, his own, no tumour could be discovered, nor could the precise seat of the obstruction be determined. From these data it would seem, as might be expected, that a previous knowledge of the presence of a growth, or of the seat of obstruction presumably dependent on a growth, leading of course to the employment of only a

¹ Bulletin de l'Acad. de Médecine, vol. ix. 1843-44.

² Archiv für Klin. Chirurgie (Langenbeck), Bd. xxiii. 1879.

³ Centralblatt für Chirurgie, 1879, Bd. ii. p. 169.

⁴ Vierteljahrsschrift, etc., Bd. i. 1880.

⁵ Berliner Klin. Wochenschrift, 1880, No. 45.

⁶ Paper read, March, 1882, before the Royal Med. and Chir. Soc., and reported in the medical journals, April, 1882.

single abdominal incision, is of great consequence as an element of success in the operation.

As to the mode of completing the operation after the colectomy was accomplished, the seven cases present these differences. In two of the four successful cases, Reybard's and Czerny's, intestinal anastomosis with enteraphy was adopted; whilst in the other, Martini's and Bryant's, an artificial anus was intentionally left; and again, in two of the three unsuccessful cases, Gussenbauer's and Baum's, the two ends of the intestine were sewn together and replaced, whilst in one (his own) an artificial anus was left. Hence, two cases out of four of enteroraphy succeeded, and two out of three of artificial anus, the result so far being somewhat in favour of the latter proceeding, which certainly is attended with less risk. But after the experience of so many surgeons of successful enterectomy, followed by enteroraphy, in cases of gangrene of the intestine and for the cure of artificial anus, and especially after Billroth's successful performance of what may be termed "gastro-enterectomy," followed by "gastro-enteraphy," we must be prepared to find that excision even of malignant growths of the intestine will be followed, in suitable cases, by attempts to appose the open ends of the divided bowel, and to unite them by sutures within the peritoneal cavity. Martini apparently contemplated this in the first instance, but could not approximate the ends of the bowel, and so had recourse to an artificial anus; and Czerny actually sewed the intestine together in two widely situated places, and yet obtained a success. It may also be here observed that the supposed greater liability to the occurrence of peritonitis from the escape of feces, as compared with gastric juice, is probably somewhat exaggerated; for an accidental effusion of a moderate quantity of feculent matter into the peritoneal cavity, or elsewhere, may be followed by its being surrounded by adhesions, and subsequently discharged through the formation of abscess; but even a small quantity of gastric juice is far more surely provocative of a diffused peritonitis. It would seem, indeed, quite possible that in some of the cases related above, and as undoubtedly happened in Reybard's experiments on animals, the sutured bowel did not quite unite directly, but through the formation of some intermediate adventitious cavity. Nevertheless, it is certain that the finishing of a colectomy by leaving an artificial anus is less hazardous than by enteraphy; and, in the former event, it might be possible, unless the lower part of the bowel were quite closed up as in Martini's operation, to cure the artificial anus by Reybard's old method, or by Dittel's or Billroth's plastic proceedings.

If, now, one compares colectomy with colotomy, considered generally, it is obvious that, as regards risk, the former is a more grave operation, and in any case of a widely adherent obstructive intestinal growth or tumour colotomy is alone to be adopted. It is doubtful, however, whether the verdict of the French school, that it is the only operation suitable to malignant strictures of the intestine, will stand the test of time and further experience. If it be objected against colectomy that a cancerous disease has probably affected the mesenteric glands, the liver, or other parts, that it is sure to recur, and that it will certainly ultimately prove fatal, and, accordingly, that the advantages to be gained by excision will not counterbalance its special risks, it may be replied that removal of a local malignant disease (of course, by the knife or scissors in this situation) is an undoubted gain, that it is the only known means of relief from cancer, that any diseased mesenteric glands may be simultaneously taken away, and that an early performance of this operation may anticipate deposition in the liver or elsewhere. At all events, suffering may be postponed and life prolonged. Certainly, if the cancerous growth be detected when it is of moderate size, movable, and easy of access, colectomy would seem to be justifiable. Whether subsequent enteraphy, or the formation of an artificial anus, should then be adopted, must be decided by

the presence of conditions quite favourable to attempting the former certainly more dangerous operation. I may here mention one very important condition of difficulty, in the way either of neat coaptation or proper invagination of the two parts of the intestine—viz., that the upper dilated and hypertrophied part is so much larger than the other collapsed and wasted part which is below the stricture or tumour. It will be noticed that the only operations with which Mr. Marshall's case can be compared are Martini's and Bryant's, for in those alone was an artificial anus left. The fatal issue, from a low form of peritonitis, in his case may have been partly due to differences in the condition of the patient; but it can also be referred to the shock of the additional median abdominal incision performed for the purpose of solving the doubt as to the seat of stricture, which, together with the subsequent search, added to the duration and severity of the operation. Had reliance been placed on statistics, a left lumbar incision into the peritoneal cavity might have been at once performed; and, one cannot now doubt, with a much greater chance of success. But with absolutely no guide in the case itself to the seat of the disease, he chose what seemed the proper line of incision. He is convinced, however, that the median incision is quite unsuited for the removal of a diseased mass in the descending colon or sigmoid flexure; it should not be adopted when the seat of the growth is known to be there. Even in a case of doubt, he should be disposed now to try the lumbar lateral incision at once. He doubts also the necessity for the deep set of suture which he employed, to fasten the outer surface of the upper portion of the bowel to the peritoneal edge of the lumbar wound; for he thinks they may give rise to puckering between themselves and the row of skin-sutures. On another occasion, he would rely on stitching the lumbar wound, peritoneal, muscular, and cutaneous, as close as possible up to the intestine, and then attaching the latter by the ordinary colotomy sutures to skin opening.—*Lancet*, May 13, 1882.

A Danger from the Use of the Double Suture after Intestinal Resection.

W. ROSER (*Centralt. f. Chirurg.*) reports the following case: An intestinal resection on account of acute femoral hernia had been performed in the clinic, but the patient, a female, died forty-two hours afterwards with all the symptoms of continued ileus. The autopsy disclosed the presence of a valve-like narrowing at the sutured spot. The first inspection of the gut showed that the lower half of the small intestine, below the suture, was quite empty, whilst the upper portion was full and distended. The gut being separated, its permeability was tested with both air and water, and it was found that fluids could pass upwards, but not downwards. Evidently a kind of valve had in some way become developed, which prevented the downward passage of the intestinal contents. On closer inspection of the portion of intestine, after it had been laid open from both ends, it was seen that a swelling of a fold of the mucous membrane of the jejunum, in combination with the sutured inversion of the edges of the wound in the gut, had produced the obstruction in question. He had in this operation followed Czerny's advice, and employed a double row of sutures. Eight of these were internal and six external, and each inclosed a half centimetre of mucous membrane. The condition of the sutured gut had seemed to be altogether satisfactory, and he returned it through the somewhat dilated femoral ring with a clear conscience. Experience has taught him, however, that this double suture has its dangers, and he would urge that at all events it be not used in operations involving the jejunum. In the latter case, in order to obtain complete inversion of the serous layer, he would advise that the lower mucous fold of the jejunum (which on transverse section usually becomes strongly everted) be dissected off circularly in

front of the stitch. In this way, at any rate, the lower fold could not become part of an obstructing valve.—*Edinburgh Medical Journal*, May, 1882.

Extirpation of a Degenerated Spleen.

CREDÉ, of Dresden, read a paper on this subject at the meeting of the German Surgical Society, in Berlin, on May 31. The grounds on which an extirpation of the spleen may be called for are either wounds of the organ or tumours, the latter depending on cystic degeneration or leukæmia. All of the fourteen cases of extirpation of the spleen performed for leukæmia have been fatal, since the affection was a general and not a local one, while the three cases of extirpation undertaken for local affection (cystic degeneration), the only conditions in which the operation is justifiable, were successful.

The operation was performed on a builder twenty-four years of age, who for twenty years had had an inguinal hernia, and on whom, ten years before, a large stone had fallen on the splenic region. Nine years after this accident he again complained of pain in the side, and a swelling of the size of a child's head gradually formed in the splenic region. A diagnosis of either hydronephrosis or cystic tumour was made, but as the mesentery and intestine lay over the tumour, it was not considered advisable to make an exploratory puncture to determine which of these conditions actually existed.

Abdominal section was performed, the incision being made to the right of the right rectus abdominus muscle, the mesentery and intestines pushed to one side, and the tumour opened, allowing a yellow fluid, containing cholesterine, to escape. Since the spleen tissue was extremely brittle, its extirpation was resolved upon. The subsequent results were in every way favourable, with the exception of occasional attacks of faintness from anæmia, and in seventeen months the patient left perfectly well.

Observations of the blood made before and after the operation showed that the white blood-cells were increased at the expense of the red eight days after the operation; that this increase continued for one month, was stationary for two months, and in the fourth month the proportion fell to normal.

In spite of the most careful examination during the convalescence no increase of size could be detected in the lymphatic glands, or was there any disturbance in the marrow of the bones, but an inflammatory swelling of the thyroid gland occurred during the fourth month.

Credé believes that these facts prove that the spleen can be successfully removed, and that its extirpation will produce a marked temporary anæmia, as after severe hemorrhage, and that for a while the thyroid will assume the functions of the spleen until the system becomes adjusted to its new relations.—*Deutsche Med. Wochen.*, June 10, 1882.

Case of Strumous Disease of the Kidney considered in Relation to Nephrectomy.

Dr. H. A. GOODRIDGE reports a case of strumous disease of the kidney occurring in a girl of 17, in whom a drainage tube was inserted into the pelvis of the kidney through an incision at the outer border of the right quadratus lumborum muscle. A half ounce of blood pus was drawn off, but no calculus could be detected. Death occurred three weeks later from exhaustion.

In reference as to the suitability of such a case for nephrectomy Dr. Goodridge says that, at the time when this case occurred, this subject of nephrectomy had hardly come to engage the attention of the profession to the extent that it has done since. Certainly the question of this operation as applicable to it was never entertained. The object contemplated, was to provide, by artificial opening and

drainage (nephrotomy), a more free exit from the kidney of the pus and other products of disease than appeared to be quite possible by the natural passage. Gravitation, it was thought also, might be made to assist and facilitate the discharge. It must be confessed, however, that the undertaking was attended with but little success. Perhaps earlier operation and a larger opening into the pelvis of the kidney might have yielded better results. The drainage-tube doubtless slipped out of its place during the last two or three days of life, when the patient was almost too weak to allow of regular dressing, and the wound closed. It is noteworthy that there was no perinephric inflammation or trace of mischief external to the kidney. But, assuming nephrectomy to be established as a recognized surgical procedure, it becomes an interesting question whether such a case as he has related be not a suitable one for its performance. There was here a completely disorganized kidney, a source of ruin to the health and of exhaustion to the strength of the patient; the fellow-kidney being at the same time all but intact, while the other organs of the body were without material flaw. It may be replied that this state of things was only fully known after death. True; and, as already stated, the question of nephrectomy was never entertained in this particular case. But, in a similar one occurring again, would it be altogether impossible to attain to such knowledge, or at least to approximate sufficiently near to it, during the life of the patient? There are two points which, taken together, seem to furnish some guide thereto: 1. The quantity and quality of the urine passed, its density (allowing for adventitious admixture), and the proportion of its proper solid constituents, especially of the urea.¹ If we should find that these solid constituents were in fair amount, regard being had to the body-weight and the general condition of the patient, one could not doubt their being good secreting structure somewhere. 2. The degree to which local signs and symptoms incline us to refer the disease to one rather than to both organs. It is needless to observe that, if there were reason to believe that both organs were at all equally involved, the question of nephrectomy could not properly arise; but, in proportion as the lesion seems to be fixed in one kidney, and this seems to be broken down and disabled by it, in the same proportion it must be inferred, from the comparatively normal condition of the urine, that the other is structurally and functionally sound, and equal to the increased strain put upon it. No doubt clinical experience is much in favour of the view that strumous disease started in one kidney extends sooner or later to the other; but we have hardly any experience as yet to tell us how the event might be after a timely removal of the main seat, if not the original source, of disease; while the drying up and obsolescence of caseous deposits are familiar pathological occurrences. Mr. Couper's case (No. 57 in Professor Czerny's list) proves at least the possibility of restoration to health, if Mr. Lucas's (No. 49, *ibid.*) does not also. To sum up, then, it would seem that strumous disease of the kidney should not *per se* and of necessity be a contraindication to the performance of nephrectomy, but that the question of its applicability to any given case should rest for its decision upon other considerations.—*Brit. Med. Journ.*, July 15, 1882.

Spontaneous Rupture of the Rectum.

A recent number of the *Revue de Chirurgie* contains an interesting article on the above rare occurrence, by M. E. QUÉNU. The author applies the title to cases of rupture, in consequence simply of muscular effort, of all the coats of

¹ Unfortunately, the process for estimating the amount of the urea was not adopted in the case reported; but, as collateral evidence, it deserves notice that the patient bore well the hypodermic injection of morphia in ordinary doses.

an apparently healthy bowel. The first case of the kind was published by our own countryman, Sir B. Brodie. M. Quénu has collected six others, one of them having been observed by himself in the clinique of Professor Richet. The records are not all equally complete. In four out of five in which information on the point is given, there was old and well-marked prolapse of the rectum. The rupture was always produced during an effort—four times during defecation, once during vomiting, once while lifting a heavy weight, and once in consequence of the patient's straining while the surgeon was endeavouring to reduce a prolapse of the rectum. Excepting for rectal prolapse, the patients were well prior to the rupture. The rupture in each case took place suddenly, at the moment of effort. The patient felt acute pain in the belly, malaise, and perceived a voluminous mass protrude from the anus. Sometimes the protrusion was preceded by hemorrhage. The general condition quickly became worse, the face pale and Hippocratic, the voice feeble, the extremities cold; the intellect remained clear. Disappearance of the prolapse immediately followed the protrusion of intestine. The straining of the patient quickly caused the expulsion of more intestine, which formed a mass hanging between the thighs, and soon became congested and inflamed. When examination is made in such cases, the relaxed sphincter commonly offers no obstacle to digital exploration, and the pedicle of the protruded swelling can be followed up to the rent in the bowel, unless the latter should be too high to be reached. The only treatment at all likely to be of service, of course, is the reduction of the mass. This is very difficult. In two cases laparotomy was performed and the bowel pulled up. In another the protruded intestine was opened and evacuated of feces and flatus. After the protruded intestine has been reduced, the rent in the rectum should be sutured. If it be possible to reduce the intestine per rectum, the laceration may possibly be also sewn up in the same way; or the rectum, if previously prolapsed, may be pulled down and then stitches put in. We would remark, with reference to this proceeding, that in the present day laparotomy is not so dangerous a proceeding as it was in the days when some of the cases which M. Quénu quotes occurred; and hence that probably now, in the presence of so grave an accident, few surgeons would hesitate to open the abdomen, pull up the prolapsed bowel, and suture the wound. To elucidate the pathogeny of this accident, Dr. Quénu has made experiments to ascertain the resistance which the rectum offers to a bursting force. Having stitched up the anus, he pumped air into the rectum, measuring the pressure. He found that the rectum would bear, without giving way, a pressure equal to that of a column of mercury sixty centimetres high (about twenty-three inches). When the pressure passed that of seventy centimetres, the peritoneal coat began to crack, and the other coats followed. We may add, that Schatz has shown that the ordinary pressure within the rectum is equal to that of a column of mercury from twenty-five to thirty centimetres high, and that it sometimes rises to that of fifty centimetres of mercury. He also tried, by forcing injections into the veins, to rupture the rectum; but the anastomosis was so free that this result did not happen, and moreover, at a pressure of forty to fifty centimetres, the vein burst in the meso-rectum. The explanation which Dr. Quénu holds as probably correct, is that the rupture takes place in the bowel of which the veins are varicose, its walls congested by prolapse, and softened by infiltration of leucocytes and inflammatory effusion. He points out that in the three recorded cases of spontaneous rupture of the œsophagus, one occurred in an immoderate drinker, and the other two were preceded by vomiting of blood; from which he concludes that the condition of the œsophagus in them probably resembled that of the rectum in the cases under consideration.—*Med. Times and Gazette*, Aug. 5, 1882.

Successful Extirpation of a Cyst of the Mesentery.

A case of the above unusual kind is reported by Dr. WERTH, of Kiel, in the last number of the *Archiv für Gynäkologie*. The patient had noticed the tumour three months before applying for advice; it was discovered during a sharp attack of colic, from which she often suffered, especially at meal-times, and after unusual exertion. She was reduced in nutrition and strength. On her admission the tumour lay above the pelvic inlet, and was very movable. It was not connected with the uterus, and the ovaries were within the true pelvis. Soon after an examination had been made under chloroform, severe pain came on in the abdomen, seated chiefly in the umbilical region, and it was found that the tumour had sunk into the pelvic cavity, and was covered by intestine, it having previously lain close to the abdominal wall. A tense cord could be felt on the left, near the middle line, running from the umbilical region to the pelvic inlet. There was frequent vomiting and rapid loss of strength, and on account of the urgency of these symptoms laparotomy was undertaken. After the abdomen had been opened, and the intestines pushed aside, this cord was found to run from the root of the mesentery to the tumour, which was in the pelvic cavity. The tumour was in the mesentery of the small intestine, subserous, covered with a fold of the mesentery, and throughout the greater part of its circumference with a loop of intestine, and a ring of mesentery, about five centimetres broad, surrounding it like a ruff. At the part not surrounded by mesentery were two small round openings, through which pappy fluid exuded. The tumour was enucleated, and after its removal some enlarged mesenteric glands were found, which were also taken away. The margins of the wound in the mesentery were brought together with catgut sutures. The patient recovered perfectly. On examination of the tumour it was difficult to make out precisely its origin; but by the method of exclusion Dr. Werth came to the conclusion that it must have originated in the mesenteric lymphatic glands. The cyst contained, as mentioned, a pappy fluid, which microscopically was found only to consist of albuminous and fatty detritus, without any formed elements; this Dr. Werth takes to have been inspissated chyle. Cysts of this kind have been described by Rokitsansky. The only other instances of cysts of the mesentery which Dr. Werth has been able to find are cases recorded by Klebs, Eppinger, Roth, and Péan, none of which appear to have been similar in nature to his own.—*Med. Times and Gaz.*, July 8, 1882.

Extirpation of Organs and Tumours of the Abdomen by Means of the Elastic Ligature.

An important communication on a new method of operating has been just made at the gynecological clinic of Professor HEGAR, in Freiburg. It would seem that a means has been found by which total extirpation of organs of the abdomen, *e. g.*, the spleen, kidneys, perhaps even of the liver, can be undertaken without very much danger. Hegar was led to use the elastic ligature in the treatment of intraperitoneal fibroid pedicles by the very favourable results he previously achieved in thus treating extraperitoneal fibroids, the danger of hemorrhage from the pedicle being by this means entirely excluded. Kasprzik, his assistant, in a communication to the *Berl. Klin. Woch.*, No. 12, 1882, has published the results of experiments upon animals, which consisted in placing pieces of elastic tubing, previously disinfected, in the peritoneal cavity of a rabbit, and killing the animal five weeks later, when it was found that the elastic had become fastened to coils of small intestine by fibrous tissue, but not a trace of suppuration was visible. Repetition of this experiment on other animals gave the same result; therefore, it was held that the elastic ligature was very well borne by the

abdominal cavity as a foreign body. A second series of experiments consisted in the tying of pieces of omentum, uterus, spleen, liver, and kidneys, partly with elastic tubing, partly with solid India-rubber ligatures, the stumps being either cut off or burnt with the thermic cautery. The results were most satisfactory in the case of the omentum and uterus, especially with the thin India-rubber ligature, which did not cut its way through the tougher tissues as it did in the case of the spleen, where much better results were obtained by the tubing. In a dog, half the spleen was extirpated, and an elastic tube put on the pedicle, which was then cauterized. Five weeks afterwards, on opening the abdomen, a coil of small intestine was found closely adherent around the stump. On removing this, the ligature was found lying in a little cavity, above adhesions to the stomach. Another dog was at the time of the report still running about with one-half of his spleen tied with the tubing, the other with the solid ligature, and was to be killed later on, in order to observe the condition after a longer period of incarceration. The liver and kidneys have not been successfully treated as yet; but Hegar is of opinion that more caution in the degree of tying and in the selection of proper tubing will later lead to success. From these experiments, it is evident that uterine pedicles can be treated without danger by the elastic ligature, which has here to deal with a firm tissue, which can be securely tied without leading to cutting through of the constricted portion, even the ligaments being capable of being treated in this manner. Kaltenbach, at the advice of Hegar, sank the pedicle of a fibroid, secured with an elastic ligature, into the peritoneal cavity after all the most carefully applied sutures had failed to control the hemorrhage; and the patient, twelve days after operation, was progressing favourably, the temperature in the vagina being 38.4 Cent. (101.1 Fahr.). Hegar uses a particular instrument for the purpose of easily controlling the amount of constriction, which is a forceps with smooth blades and rounded edges, having a spring catch to fix its jaws. For temporary ligature, this fixation would be sufficient; for permanent, it is necessary to fasten the two ends behind the forceps with a wire or silk thread, then to remove it and cut the ends short, the rubber piling itself in front of the constricting-wire, and thus precluding the possibility of slipping.—*London Medical Record*, June 15, 1882.

Abortive Treatment of Gonorrhœa.

MR. W. WATSON CHEYNE states that he always uses for this purpose an injection of sulpho-carbolate of zinc (two grains to the ounce of water), begun after the introduction of one or two of the iodoform and eucalyptus rods, copaiba being at the same time administered internally. The following is the mode in which he proceeds: The patient is told to pass his water; he then lies down, and an iodoform and eucalyptus rod is dipped in eucalyptus oil, and passed into the urethra; a small pad of boracic lint is applied over the orifice, outside this a large piece of gutta-percha tissue, the whole being fastened on by strapping. He is told to allow this to remain as long as he can, generally about five or six hours. He then takes it off, passes water, injects one or two syringefuls of the sulpho-carbolate solution, and if the case is very acute another rod is introduced. Afterwards he uses the sulpho-carbolate of zinc injection as often as he can (six or seven times a day generally), always passing water before its use in case any infective material remains in the urethra, which might be driven back before the injection. Mr. Cheyne always recommends that a piece of boracic lint be kept over the orifice of the penis to absorb the discharge; this can be retained in position by drawing the prepuce down over it. A purge is administered at the first, and the bowels are afterwards kept freely open by salines. Copaiba is also given

in half-drachm doses thrice daily from the beginning. The patient is further cautioned against the use of beer or spirituous liquors, etc. After three or four days, when the acute symptoms have subsided, an injection of sulphate of zinc, tannin, acetate of zinc, or, indeed, any of the astringent injections in common use, is substituted for the sulpho-carbolate, which, in his experience, though the best injection at the beginning, does not, as a rule, arrest the discharge in the chronic stage nearly so rapidly as some of the other injections. After the discharge has ceased, the injection, and possibly also the copaiba, at any rate the restrictions as to drink ought to be continued for four or five days, so as to avoid a recurrence of the discharge.

He sums up the results of this investigation shortly as follows: The treatment recommended here—the use of one or two iodoform and eucalyptus rods, an injection of sulpho-carbolate of zinc, and the internal administration of copaiba—has the effect, in the great majority of cases of acute gonorrhœa, of checking the acute symptoms in a day or two, and bringing the disease rapidly to the chronic stage, thus avoiding all the risks dependent on the violence of the inflammation. The discharge at this time is very amenable to treatment, and gets rapidly well under the use of suitable remedies. All that he claims for the method, however, is that it cuts short the acute stage, in the great majority of cases, and thus the patient escapes the dangers and pain incident to that stage. The essential parts of the method are the use of the bougie and the injection; but the rapidity of cure is much aided by commencing the use of copaiba or sandal oil at once. The method may be employed at any stage of the disease, but is, in his experience, only of use before or during the acute stage, up to (say) the eighth day. The result is the more marked the more acute the inflammation, the rapid subsidence of the inflammatory symptoms being very striking. Even in the very few cases in which it has failed to produce this effect, it has not, so far as he can judge, done any harm. The addition of bichloride of mercury, though a powerful antiseptic, to the rod, or its use in the form of injection, does not seem to be of advantage. It is possible that the combination of counter-irritation with this method may yield even more rapid and satisfactory results.—*Lancet*, Aug. 12, 1882.

Congenital Sacral Tumour.

Dr. W. R. BLAILOCK reports the case of a female infant, with talipes varus, in whom he found a large pendulous tumour extending across the sacrum just below its articulation with the fifth lumbar vertebra. It extended around about two inches on each side from the spinous process of the first sacral segment. From above downwards it extended about two inches. The length of the tumour was about seven-inches, and was covered by skin to within one and one-half inches of the centre of the outer posterior, where it broke off abruptly into a thin vascular membrane, leaving a circular area of this membrane three inches in diameter. The diameter of the thickest part of the tumour was four and one-half inches.

Pressure did not appreciably diminish the size of the tumour, nor produce any tension in the fontanelles. There was no discoverable opening into the spinal canal. Serous fluid was oozing from the outer part; a small opening was made, and between one and two quarts ran out. Dr. Blailock decided that the sacral tumour had no connection with the theca, and determined to remove it at once. The infant was four hours old at the time of the operation.

He made a transverse incision from above into the sac, which revealed the fact that there were four or five vessels passing from the extreme outer portion; or from that part of the tumour that was not covered by skin into the first pos-

terior sacral foramina. On severing these cords they proved to be veins. Careful examination failed to show any connection between the tumour and spinal canal. The wall of the cyst was composed of two membranes, connected by areolar tissue. The inner membrane was continuous throughout the inner part of the cyst wall, and was reflected backwards from the outer part, forming the external coat of the veins as they passed into the cavity of the tumour. The outer layer, within one and one-half inches of the apex (leaving a circular area of three inches diameter), was thickened skin, which was a continuation of the skin of the back. It broke off abruptly, giving place to a thin vascular membrane that was studded with numerous vascular tufts that had connected it with the placenta. The inner surface of the membrane that was attached to the placenta gave exit to numerous small veins that had only two coats, the external of which was simply a backward extension of this membrane. The inner coats penetrated this membrane, and whether they connected with the placenta by anastomoses, or otherwise, he was unable to determine. The umbilical cord was below the average size, but otherwise normal. The child died of hydrocephalus four days after the operation.—*Miss. Valley Medical Monthly*, Aug. 1882.

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Diagnosis of Hip Disease by Rectal Examination.

Dr. CAZIN (*Rev. de Chir.*, March, 1882) refers to the difficulty of diagnosing the exact seat of the disease, especially with regard to the acetabulum. This difficulty is of much importance when the question of resection has to be considered, and is one of the strongest points of argument advanced by the opponents of resection. The author made researches in 98 cases of hip-joint disease, 64 being suppurative and 34 non-suppurative. Hitherto only incomplete evidence has been obtained by depending upon the seat of the pain, the seat of abscesses and fistulæ, and by exploration with the sound.

Abdominal palpation enables us to detect enlarged iliac glands or pelvic abscesses; but if we also examine the patient through the rectum, the diagnosis will be much more sure. The hip-joint, from its deep position in the tissues, is not very accessible to ordinary methods of examination, but the finger can approach it most easily through the rectum. In the cavity of the pelvis, immediately above and a little behind the obturator foramen, is a quadrilateral surface of the bone, corresponding with the bottom of the acetabulum. In a child under fourteen years of age, this part of the pelvis is partly cartilaginous. The Y-shaped cartilage is so situated that the area of the base of the acetabulum is divided by a transverse line of cartilage into two equal parts, and the lower half is again divided by the horizontal line of cartilage.

In examining a patient, the natural extent of the cartilage should be considered, and the two sides should always be explored for the sake of comparison. This mode of examination has afforded appreciable results in 49 of the 98 cases which Dr. Cazin has had under observation. Of the 64 cases of suppurative hip-joint disease, positive results were obtained in 37; of the 34 non-suppurative cases, in 12 only was the examination *per rectum* diagnostic. The ages of the patients were between three and eighteen years, and the majority were between eight and ten years; 41 were boys and 23 girls. Examination *per rectum* disclosed an alteration in the pelvis in 36 of the cases. Sex has no importance with regard to the facility of examination. Among the elder girls the presence of the uterus has caused very slight trouble, and the position "on the knees" has facilitated the examination. In young adult females recourse should be had at the same time, or exclusively, to examination *per vaginam*.

The results of Dr. Cazin's examinations have been verified six times by resection, four times by necropsy, and twice by resection and necropsy combined.

The symptoms elucidated by a rectal examination have been pain localized to the postcotyloid surface, produced by pressure; enlargement of the intra-pelvic glands; thickening of the bone; depression, flexibility, mobility, destruction or perforation of the postcotyloidean surface; congestion of the soft parts; and pelvic abscess.

Pain upon pressure is the least certain of these symptoms. If the bone be penetrated, and the head of the femur be felt by the finger, a doubt in diagnosis may be removed if upon movement of the thigh the head of the femur is felt by the finger (*per rectum*) to move. Many cases are recorded. One was the case of a girl, thirteen years old, in whom there were some symptoms of hip-joint disease, but it was thought by one of Dr. Cazin's colleagues that contraction of the muscles was the only affection. Under chloroform the deformity disappeared, and the joint became freely movable; and it was only by a rectal examination, which disclosed a postcotyloidean swelling, that Dr. Cazin was convinced that articular disease existed. In conclusion, Dr. Cazin urges the adoption of this means of diagnosis, in addition to other methods, especially in reference to the subject of excision of the joint. He also maintains that *redressement forcé* should never be attempted until an examination *per rectum* has been made.

The only other surgeons who, Dr. Cazin states, have referred to this method of diagnosis in hip-joint diseases are Mr. Holmes, in his work on *Surgical Diseases of Childhood*, and MM. Mathieu and Strauss, who have quoted Mr. Barwell.—*London Med. Rec.*, June 15, 1882.

Perforating Ulcer of the Foot accompanying Locomotor Ataxia.

Dr. MORER reports a case of locomotor ataxia, which was preceded by a perforating ulcer of the foot. This case resembles closely the observation of M. Christian: anterior perforating disease, period of maniacal excitement with delirium, incoördination of movement, emaciation, darting pains, and paralytic childishness.

But it is not the possible connection between the general paralysis and locomotor ataxia to which it is desired to draw attention. Dr. Morer only remarks that his opinion has been supported by Duplay and Minot (*Arch. Gén. de Méd.*, 1873), and developed by Professors Charcot, Ball, and Thibierge, in their communications to the Medical Congress of London (*Arch. Gén. de Méd.*, Sept. 1881), viz: that the perforating disease is a direct consequence of the nervous disease as any other trophic trouble.

It is desired simply to draw attention to a fact, which we think has not been sufficiently emphasized by authors, and which seems to be of some importance. It is, that often the perforating disease appears suddenly at the outset of the nervous disease, when only the stage of incubation has been passed, and when the diagnosis has not been made by the physician. In support of this assertion four cases can be cited, though it is probable that this number could be largely increased by more extended search.

In the first case, M. Christian noticed the appearance of general paralysis on October 17th, 1880, and he states that the indications were probable that the disease had existed for two years. In the second case there was also general paralysis, accompanied at first by certain ataxic phenomena, and at the time of their appearance there existed a perforating ulcer of the left great toe; the same disease had existed on the right side in the course of 1880.

M. Hanot published in the *Archives de Phys.*, 1881, notes of two cases of perforating ulcer in locomotor ataxia; in the second, it is stated that the perforating

ulcer was under treatment in 1878, and that it was cured in about six months. The patient stated that about this time he found that he had difficulty in walking. In January, 1880, the symptoms of tingling appeared in the right side, and then passed to the left; walking became difficult, and ataxia was developed in October, 1880.

In another case, occurring in M. Morer's own experience, the perforating ulcer appeared in 1877 or 1878; mania in 1880, though no symptoms of ataxia were then present, but appeared in October, 1881.

The demonstration in four instances of the existence of perforating disease before the onset of ataxic symptoms would be even more interesting were the number of cases larger. It seems, however, that it can be admitted that in a certain number of cases the perforating disease appears during the incubation of nervous affections (general paralysis and locomotor ataxia), a fact which may be of some prognostic value, and should direct treatment towards the initial point of these diseases.—*Gazette Hebdom.*, July 28, 1882.

Spontaneous Gangrene of the Skin.

At the Vienna Medical Society (*Allg. Wiener Med. Zeit.*, May 16, 1882), Prof. NEUMANN exhibited a patient, the subject of a rare if not an unique affection of the skin, viz., spontaneous gangrene. In all the few cases resembling it which have been hitherto published, there have been preceding diseased conditions of the system, and the gangrene has manifested itself in the course of some days, but in this case the acute character of the attack is the chief point of interest. The patient, an anæmic girl, eighteen years of age, and with spare menstruation, had suffered from the affection from October 15 until March 29, and had been under the care of the same medical man, who then transferred her to Prof. Neumann. The first gangrenous spots were observed in the palm of the hand, seven in number, and were succeeded by efflorescences about the size of a florin in the region of the clavicle and manubrium sterni, where nine gangrenous spots of pretty equal size were developed. Numerous gangrenous spots then succeeded each other on both arms, and finally two appeared underneath the left patella. These appearances were preceded by a burning sensation which lasted for some minutes, the skin then becoming reddened over a limited space, somewhat raised, and its temperature increased. These spots became gradually circumscribed from the surrounding skin, and appeared first of a brownish and then of a dead-white colour. Sensation was first entirely abolished at the periphery, and in about half an hour at the centre also, the whole mass forming an eschar of the cutis. These occurrences were observed by Prof. Neumann personally on four occasions. A secretion of serous liquid also took place in the vicinity, and from some of the eschars ramifications radiated, somewhat in the manner that is observed when the surface has been struck by lightning. The sloughs separated between the tenth and fourteenth days, raised up by rapidly increasing granulations. In two sloughs which were separated by the scissors, a microscopical examination enabled the unchanged panniculus adiposus and the enlarged veins of the subcutaneous connective tissue to be distinguished. Unable to assign any cause for this diseased condition, Prof. Neumann thinks it probable that it may depend upon vaso-motor disturbance. Docent Dr. Weiss, who had attended the case with Prof. Neumann, believes that it probably is a disease of the peripheric nerves, conditions similar to which have been described by authors, and especially by Charcot. The acute decubitus in various diseases of the spinal cord would seem to be of an analogous nature. Hofrath Prof. Billroth said that the case gave him the impression of an artificial disease, and that he suspected that the

girl was guilty of some deception. The diseased parts look as if caustic potash had been passed over them. The case bore no relationship to the one described by Raynaud, which was that of a delicate anæmic French woman. The blood ceased to circulate in the ends of her fingers, which became blue, and then gangrenous. The granulations which succeeded were pale and flaccid, so that many months were required before cicatrization could be procured. But here we have a strong and well-fed girl, the parts which it is pretended are spontaneously attacked corresponding neither to the course of a nerve nor to that of the vessel, while the granulations which succeed to the fall of the slough are splendid, and almost characteristic of caustic eschars. How are we to explain why portions of the skin which are said to have spontaneously mortified on account of defective nutrition should afterwards manifest such powerful recuperative power? "If we are not in the presence of a miracle—and I am no believer in miracles—the case is absolutely incomprehensible. On the other hand, it is only too well known what hysterical women will do to render themselves interesting—swallowing needles or sticking them into their persons, or inflicting severe pain upon themselves in other ways. The first thing to be done here is to ascertain whether this girl is not practising an intentional deception." Prof. Neumann opposed this view energetically, stating that the eschars produced by caustic potash had quite another appearance (Hofrath Billroth observed that other caustic substances might have been used). "And then I have expressly stated that I have *observed* the case. The parts of the skin attacked first became raised and reddened, and then lost their colour, a white, and only later a brown, eschar forming. I have described the case as unique, and cannot believe that any deception is being practised. We have here to do with a disease." Hofrath Billroth added, "I can only repeat to you the words of my teacher Romberg, 'Never believe a woman, even when she appears to be dead.' " Prof. Auspitz could not regard this case as an example of symmetrical gangrene, although he could not go so far as Prof. Billroth and explain it by declaring the woman an impostor. In analogous cases a more or less complete stasis of the bloodvessels or cessation of the nerve-function has been adduced; but a case like this he had never met with. Prof. Neumann promised to comply with a suggestion made by Prof. Albert, that the sloughs should be chemically examined, to ascertain whether they had been produced by the influence of mineral acids or caustic alkali.—*Med. Times and Gaz.*, June 24, 1882.

OPHTHALMOLOGY AND OTOTOLOGY.

A New Ptosis Operation.

The insufficiency of operations hitherto proposed for the relief of complete or nearly complete ptosis, with little or no power in the levator, is well known. PAGENSTECHER has devised an operation which depends for its effect on bringing the frontalis to act directly on the upper lid, and thus substituting the action of this muscle for that of the levator. This is accomplished by producing a superficial vertical cicatrix connecting the frontalis with the edge of the lid. A needle is entered about a finger's breadth above the supraorbital ridge, and carried downward beneath the skin to emerge at the level of the lashes; a thread is drawn through and the ends tied together without much dragging. Each day the thread is pulled on till it finally cuts its way out. The reaction is very moderate; the disfigurement caused by the scar is very little, and much more than made up for by the improvement in appearance obtained by relief of the ptosis. Pagenstecher has found one suture suffice in the cases operated on, but suggests that two may

sometimes be necessary. For incomplete ptosis a modified form of procedure is advised. A thread armed with two needles is used. One needle is passed under the skin of the lid, parallel to and near the lashes, for a distance of one or two millimetres, drawn through, reëntered at the point of exit, and carried upward beneath the skin to a finger's breadth above the supraörbital ridge. The other needle is then carried from the point where the first needle entered, also upward, to emerge at the same place as the first above the brow. The two ends of the thread are drawn moderately tight and fastened. The loop thus formed may be removed after a longer or shorter time, or allowed to cut itself through, according to the indications of the individual case, and in this way a wholly subcutaneous cicatricial cord is produced. Care should be taken not to sink the needles so deeply above the brow as to wound the periosteum, lest a connection between the skin and periosteum might occur and prevent movement of the vertical cord.—*Practitioner*, August, 1882.

Quinine Amaurosis.

Five cases of amaurosis, due to the administration of overdoses of quinine, are quoted in the *Cbl. f. d. Med. Wiss.*, 17th June, 1882. The first of these is recorded by Dr. E. GRUNING, in *Arch. f. Augenheilk.*, xi. 145. The patient, a woman suffering from endometritis after abortion, took 80 grains of quinine within thirty hours, when she was seized with a convulsive attack, after the subsidence of which she was perfectly blind and deaf. In twenty-four hours the hearing returned. The pupils remained fully dilated, but the power of accommodative contraction was still present. Refractive media normal. Papilla extremely pale, and retinal vessels, both arteries and veins, so narrow as to be scarcely visible. At the macula lutea of both eyes was a cherry-red patch, surrounded by a grayish-blue opaque zone. The latter disappeared in ten days, while the retinal vessels remained unchanged. After fourteen days more, sensibility to light had returned to a slight degree. Sight improved gradually, but complete colour blindness remained. In three months sight was again perfect, but a concentric limitation of the field of vision was noticed. In three months more the colour sense was also almost completely restored, but the limitation of the visual field persisted.

Dr. C. E. Michel records an exactly similar case in the same number of the same periodical. His patient, who suffered from pneumonia, took 225 grains of quinine within five days, after which complete blindness and deafness supervened. The same condition of pupils, etc., as in last case was observed. At the end of a year the sight was nearly normal, but there was a concentric limitation of the field of vision; no visible change in the fundus of the eye remained.

Dr. H. Knapp records in the same journal three cases of blindness and deafness from large doses of quinine. In all of them the deafness soon passed off, while sight returned very slowly; there remained in all the same concentric limitation of the field of vision. In all the condition of the optic nerve and retinal vessels was as already described above. Colour sense and sensibility to light returned gradually, while the pupils slowly regained their natural mobility.

In cases of blindness from overdoses of quinine the prognosis is thus on the whole good, as in all the above instances sight was restored, though not in all respects completely.

Treatment must be directed towards keeping up the general strength. The horizontal position seems often to aid in the cure of the affection. Inhalations of nitrite of amyl had no influence on the patients' condition; neither had the use

of electricity, strychnia, and other agents. Residence and exercise in a salubrious climate may be recommended as a rational means of cure.—*Glasgow Med. Journ.*, Aug. 1882.

Sclerotomy.

Recently the Ophthalmological Society held two important and numerous attended meetings, to elicit the opinions and experience of the members in regard to sclerotomy, an operation that has been introduced and recommended chiefly by M. de Wecker, of Paris, but which has not as yet been very generally adopted either in this country or abroad. The operation of iridectomy, which has up to this time received the approval of all those who are engaged in the treatment of diseases of the eye, was the gift of v. Gräfe, and it was found to possess the invaluable power of reducing the tension of the globe of the eye when increased, as in glaucoma, not temporarily, as might result from simple tapping of the aqueous humour through the cornea, but effectually, and to this permanent relief or cure of all the symptoms. Though generally answering fully the expectations of its proposer, and nearly always successful in cases of acute glaucoma, if properly performed, it yet had its dark side. It was not well adapted for cases of hemorrhagic glaucoma. It was not always successful in cases of chronic glaucoma; and there were serious objections to its employment on æsthetic grounds. It was not surprising, then, that other modes of reducing the abnormal tension by operation should be tried. In 1857 Mr. Hancock suggested division of the ciliary muscle by plunging a double-edged knife into the vitreous, which appears, from the statements made by two of the speakers, to have been very successful in acute cases, and fairly satisfactory in subacute forms of the disease, and to be still practised at one of the ophthalmic hospitals. Some years later the operation of sclerotomy was suggested. This operation consists in passing a straight, narrow knife through the cornea, and cutting as in the incision for extraction of cataract, except that the knife is withdrawn before the section is complete, so that a small bridge of the cornea or sclerotic is left. In the course of the debate it appeared that different operators varied slightly in their mode of performing sclerotomy, some making the section completely through the cornea without leaving a bridge, whilst others carried the incision much farther back, so that the section was really made through the sclerotic. Living examples of both modes of operating in which success had been achieved were exhibited to the members of the Society; but if appearance alone is consulted, and if subsequent experience should support the corneal incision, there can be no doubt that it is vastly superior to the other, which creates a large staphyloma in the ciliary region of the eye, a condition that in cases of accident is regarded as being fraught with peculiar danger, since wounds in that region are frequently followed by sympathetic mischief. Sclerotomy does not appear to have been performed very frequently in this country, and none of the papers that were read, nor of the speeches that were made in the course of the debate, bore evidence of very large experience. The operation is upon its trial, and several of the cases referred to by members of the Society seem to have been nearly hopelessly blind, the adoption being essentially tentative or experimental, and in such cases good results could hardly be expected. In truth, much larger experience is required before any definite conclusion can be arrived at. The causes of glaucoma and glaucomatous conditions are very numerous, for it has been shown to arise from increased secretion, from diminished drainage, from tumours, from hemorrhages, and various other states; and it is highly improbable that any single procedure will effect a permanent cure. Still, as the essential feature of all these conditions is an in-

crease in the tension of the eye, something will be gained if by such an operation as sclerotomy the tension can be temporarily, and possibly permanently, reduced without spoiling the appearance of the eye; whilst if failure occurs and the tension should again increase, the performance of iridectomy is still left open to the surgeon.—*Lancet*, June 17, 1882.

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Relation of Liver-Diseases to Retinal Affections.

Dr. LITTEN has communicated (*Deutsch. Med. Woch.*, 1882, No. 13) the results of his ophthalmoscopic examinations during the last ten years of patients affected with liver-disease. The changes observed he divides into three classes; first, extravasations, mostly in the granular layer; second, white patches in the retina caused by fatty degeneration; and, lastly, retinitis pigmentosa. Extravasations he has observed in fifteen cases of liver-disease; namely, in four cases of uncomplicated obstructive jaundice, partly catarrhal, partly through calculi, in four cases of hepatic cancer, in one case each of acute atrophy, of phosphorus-poisoning, of hepatic abscess, and of dropsy of the gall-bladder, and in two cases of cirrhosis. In the four cases of obstructive jaundice the extravasations appeared at the climax of the disease, and caused no disturbance of vision. The case of abscess was the result of calculi, and was the only one out of many such cases in which Dr. Litten observed retinal extravasation. He finds that retinal extravasation is almost a constant symptom in those cases of hepatic abscess occurring from embolism in septicæmia and other infective diseases. In the case of dropsy of the gall-bladder no hemorrhages were observed till the swelling was aspirated, when retinal extravasation was very soon found. Of the above fifteen cases, only seven proved fatal, so that it cannot be regarded as an unfavourable symptom, as has been supposed. At the same time, Dr. Litten in these seven cases found extravasations in other organs, and no doubt there were also extravasations in those cases that recovered. These extravasations do not seem to be caused solely by the deleterious effect of the bile in circulation, for Dr. Litten has found that retinal extravasation never occurs in dogs and rabbits from ligature of the bile-ducts, notwithstanding the marked jaundice produced thereby.

The second form of retinal alteration, Dr. Litten has observed in a case of phosphorus poisoning, resulting in acute atrophy of the liver. The retina in this case was studded with white patches, about a sixth or a fourth of the size of the pupil, and these patches he found *post mortem* to be caused by fatty degeneration of the retina, with numerous "granule corpuscles." A case of phosphorus poisoning, with acute atrophy of the liver, has since been published by Duke Charles of Bavaria, in which centres of fatty degeneration were found in the cortex cerebri; and Dr. Litten considers that here, as in many other cases, the ophthalmoscopic appearances of the fundus oculi gave us an opportunity of observing the pathological processes going on in other organs.

The third form of retinal change, consisting in typical pigmentary degeneration of the retina, Dr. Litten has observed in two cases of liver-disease, both cases being hepatic cirrhosis in the stage of contraction. The first patient was a man aged 58, with extreme ascites. He complained of failure of sight, consisting in hemeralopia and a narrowing of the field of vision, with good central vision. The ophthalmoscope showed characteristic retinitis pigmentosa. After paracentesis, however, neuroretinitis appeared, with marked increase of the pigment and loss of central vision. The second case was also a male, aged 42, who was admitted for ascites without jaundice. The fundus and vision were normal on admission; but after some time he complained of hemeralopia, but with no narrowing of the field of vision. The ophthalmoscopic appearances were characteristic, and during the eight days that the patient was under observation increased markedly. Unfor-

unately, neither of these patients could be kept under observation for any lengthened period. Landolt has observed retinitis pigmentosa in a case of hepatic and also in a case of nephritic cirrhosis, and considers that it is a chronic inflammatory process, in which the nervous elements of the retina are destroyed by the connective tissue, formed in the first place in the adventitia of the peripheral retinal vessels. This process seems closely allied with the chronic inflammatory process resulting in contracted liver and contracted kidney; not that either of these conditions produces the retinal affection; but the patient affected with the two diseases has either by heredity, by syphilis, or some other cause, a disposition to the formation of connective tissue in certain organs. The degeneration of the retina depends on diminished nutrition, and is associated with a disappearance of the retinal pigment, and a migration of the same into the innermost retinal layers. Dr. Litten has also proved experimentally that the pathological pigment of the retina comes from the choroid, with which it is allied both histologically and chemically. How the migration of pigment takes place he cannot explain. He mentions, however, a fact recorded by Professor Bischoff, that two dogs, in which he had formed a biliary fistula, became completely amaurotic, and their eyes showed *post mortem* the appearances of retinitis pigmentosa as it occurs in the human eye; but the pigment was deposited also in the hyaloid membrane, and even in the lens.

The record of careful and prolonged observations like those of Dr. Litten is in the highest degree important. Through the work of Dr. Hughlings Jackson, we have in this country become aware of the importance of ophthalmoscopic examination in all cases of nervous affection, and we are probably all of us fully impressed with its value in Bright's disease; but we are still too much inclined to isolate the ophthalmoscopic changes as peculiar to the eye, and having little or no association with changes occurring in other organs. Such observations as those of Dr. Litten, recorded above, have a general value in correcting this error, as well as a special value in extending our knowledge of ophthalmic diseases. At the same time, we must remark that the value of his observations would have been very considerably increased, had he stated in what proportion of patients with liver-disease retinal changes occur, and also had he stated definitely in each case that there was no possibility of complication.—*London Med. Rec.*, June 15, 1882.

MIDWIFERY AND GYNÆCOLOGY.

The Acceleration of Delivery in Puerperal Convulsions.

A recent number of the *Arch. f. Gynäkol.* contains an article entitled "A Contribution to our Knowledge of Eclampsia," by Dr. Fr. SCHAUTA, assistant in the clinic of Professor Späth, of Vienna. The paper gives statistics based upon the large number of 134,345 labours, among which 344 cases of convulsions occurred. Figures are furnished bearing upon many points in the natural history of this disease, which are of much value, and deserve the attention of specialists.

Convulsions coming on during pregnancy quite as often, according to Dr. Schauta, persist during labour, as cease before that process begins.

The commonly received opinion that convulsions first attacking the patient during labour, commonly cease when delivery is complete, Dr. Schauta finds to a great extent negatived by the facts he has collected.

The practical point, says Dr. Schauta, which springs out of these results seems to be this—that in labour complicated with convulsions the accoucheur should not allow himself to be persuaded into operative delivery unless the clearest indica-

tions exist, and the necessary conditions are present; and that the *accouchement forcé*, now on other grounds rightly abandoned, should, looking at the prognosis of puerperal eclampsia, be unconditionally condemned. Our author proceeds to test this practical conclusion by analyzing the cases according to whether or not labour was artificially completed. Out of the 42 cases of convulsions occurring during pregnancy, 20 were delivered spontaneously, 21 by the help of the accoucheur (one passed from observation undelivered). Of the former, 2 died, or 10 per cent.; of the latter, 19, or 90.4 per cent. This 19, however, includes 5 who were delivered by Cæsarean section after the death of the mother; the subtraction of these reduces the mortality to 87.5 per cent. Of course it will be obvious that the cases in which interference to effect delivery was resorted to, were in all probability the worst cases, and the enormous difference in the result between those left to nature and those artificially delivered is probably for the most part to be accounted for in this way. But admitting this, it is also evident that the acceleration of labour did not do very much for the patients. The result shown by cases of convulsions coming on during labour is much the same. There are, however, two good reasons, our author points out, for hastening delivery—if we can do so without doing harm. The first is, that by emptying the uterus, the intra-abdominal pressure, which in the large majority of cases is a main cause of the kidney-changes which produce eclampsia, is reduced, and therefore the earlier delivery takes place, the earlier the *restitutio ad normam* may be expected to begin. The second is, that the sooner delivery is effected, the better chance the child has of survival. The risk to the child, as well as to the mother, Dr. Schauta shows, is in proportion to the number of the fits. The prognosis for the child is, as perhaps might be expected, worse when the fits come on before, than when they commence during labour. The infantile mortality among the cases of the former class which Dr. Schauta tabulates was 41.8 per cent.; among those of the latter, 20.5 per cent.

In considering, in the light of these figures, whether in eclampsia delivery ought to be hastened, the question naturally occurs, whether the bad results enumerated may not have been the result of an aggravation of the nervous condition by the operation necessary to effect delivery, *i. e.*, whether operative delivery *per se* has any influence in producing convulsions. Dr. Schauta has, with this point in mind, analyzed the cases in which eclampsia appeared after labour. He finds that 74 of these had been naturally delivered, of whom 19 died, or 25.6 per cent.; 8 had been delivered by operative aid, of whom 2 died, or 25 per cent.—a proportion nearly the same.

These figures seem to us of considerable practical moment. It would be going too far to regard the high mortality among those who were delivered by art as due solely to the mere fact of interference. It seems to us largely explained by the consideration that the cases in which this treatment was resorted to were probably the worst; and it may also have been sometimes the case that the state of the patient led the medical attendant to hurry delivery more than he would have done had death seemed less imminent, and in doing so to inflict damage which might have been avoided had less haste been used. If pregnancy has anything to do with the causation of the disease in question—and that it has, we think, there cannot be a doubt—we might expect that the removal of so powerful a cause would favour recovery. But Dr. Schauta's cases show this—that there is no such immediate advantage as to justify us in running any risk of other dangers for the sake of speedily ending the pregnancy. If labour has begun, or if it has been induced, it is best left to take its course with the minimum of interference. It seems to us still an open question whether labour may not be induced with advantage, provided the process be conducted in a manner as closely as possible

approximating to that of nature; but whether induced or at the natural term, such interference as would be called for if there were no convulsions is alone that which is required. Everything further is submitting the patient to unnecessary risk, without any compensating advantage.—*Med. Times and Gaz.*, Sept. 2, 1882.

A Modified Procedure in Cæsarean Section.

KEHRER (*Arch. f. Gynäkol.* 2, 1882) publishes a lengthy paper on a *modified procedure in Cæsarean section*. This operation would not have so dangerous a rival in the method of Porro were it not for the magnificent series of changes which has been effected by the antiseptic theory. The negative influence of this theory upon the Cæsarean operation is due to the fact that we have not yet learned to close the uterine wound so securely as to prevent the entrance of lochia into the abdominal cavity. Three methods of closing the uterine wound have obtained: 1. Lebas's (*Journal de Médecine*, Supplément de l'Année 1770, p. 177), which is the simple bringing together of the sides with sutures. 2. Pilloris's (*Gazette des Hôpitaux*, 1854, p. 148), and E. Martin's (*Monatschrift für Geburtskunde*, Band 23, p. 334), by which the edges of the uterine wound are attached to the corresponding edges of the abdominal wound. 3. Frank's (*Centralblatt für Gynäkologie*, 1881, p. 25), by which the round ligaments are united to each other, and to the edges of the abdominal wound, with drainage of the ante-uterine space. [A description of this method will be found in the March number of the *Journal*, p. 302.] In the first-mentioned operation the sutures sometimes fail to hold, perhaps on account of after-pains, or from the involution process, or by reason of lochial infiltration. In the second operation the lochia can, indeed, be kept out of the abdominal cavity, but contraction and involution of the organ may be seriously interfered with, from the position which the uterus is made to assume. Since all these methods are ineffective, it is desirable in this operation: 1. To find a point at which the edges of the uterine wound are least inclined to gape. 2. To discover a reliable method of suturing. 3. To prevent infection, and to carry off the peritoneal transudation and the lochia. To accomplish these ends the author proposes: 1. An horizontal incision at the anterior aspect of the os internum. 2. Double uterine suturing—that is, suturing of the muscular tissue and also of the peritoneum. 3. Precise antiseptic precautions, drainage of the peritoneal cavity, irrigation, and possibly drainage of the genital canal during the puerperal period. The reasons for the first proposition are: 1. There will be less tendency of the uterine wound to gape. 2. Hemorrhage will be less free, as the placenta is rarely located in this position. 3. The abdominal incision can be shortened by this operation. 4. The foetal head will commonly be met with at this site, and extraction will be facilitated. 5. Over and under the os internum the peritoneum is connected to the uterus by subserous connective tissue, which is easily separated. As objections to this operation thus modified, may be urged: 1. The narrowness of the opening and the consequent danger of its forcible enlargement in removing the foetus. 2. The danger of opening the great venous plexuses at the side of the uterus or near the os internum. 3. The lochia can easily pass into the subserous connective tissue behind the bladder and cause a parametritis. The second proposition has been called for, as already stated, on account of the contractions which accompany involution. The double series of sutures, together with careful antiseptic precautions, will prevent the entrance of lochia into the peritoneal cavity. As to the third proposition, the most stringent antiseptic precautions are necessary. Experience has taught the author that it is better in every Cæsarean section to use several drainage-tubes. It is also well to introduce thoroughly carbolyzed

cotton into the tubes, and get the benefit of capillary attraction upon the peritoneal transudation. One tube should be carried into each side of the vesico-uterine excavation, and a third behind the uterus into Douglas's pouch. A description of two operations by the author follows: one patient recovered, the other did not. Some remarks are also appended as to the indications for the operation.—*N. Y. Med. Journ.*, Aug. 1882.

Retention of Fœtus during Six Years; Removal of Bones through the Anus.

At the meeting of the Cambridge Medical Society on June 2, Mr. HOUGH, after making some general observations on extra-uterine pregnancy, related a case of a patient under his care, who was now twenty-nine years old, and had been married twelve years. In September, 1874, she became pregnant for the first time, and menstruation ceased. Throughout January and February, 1875, she had more or less sickness; but did not come under observation till early in May, when she sent for Mr. Hough, on account of a slight discharge of clotted blood, and some pain. Labour appeared to be commencing, and she was recommended to keep quiet, and send for a nurse; no vaginal examination was made. In a few hours, the pain abated, and the discharge ceased; at this time, distinct fetal movements were felt, and the fetal heart was heard. She was seen from time to time till the autumn, but nothing calling for interference occurred. The shape of the body altered, the tumour being more to one side than previously had been the case, and the milk disappeared. In October, she was seen by an eminent metropolitan surgeon, who diagnosed ovarian disease, and recommended her to take liquid extract of ergot; and, after taking this for a fortnight, the catamenia came on, and had continued regular from that time to the present. For several years, Mr. Hough lost sight of her; but, at the beginning of the present year, she consulted Dr. Humphry, who at once communicated with him about the case. At this time, the great pain from which she suffered rendered further examination necessary. Ether was administered; and, on examination *per rectum*, a large cavity, in which the bones of the fetal head could be felt, was discovered, and one by one Dr. Humphry extracted the fetal bones, through the opening in the bowel, by the finger. The patient did extremely well, and at the present time no trace of the cavity remained, and she was in perfect health.

Dr. HUMPHRY gave an account of an almost precisely similar case. The patient, aged 24, had been married about a year, when the catamenia ceased, and the breasts and abdomen began to enlarge, and for a time there was morning sickness. At full time, the symptoms of labour (recurring pains, with coloured discharge) came on. The labour was unusually protracted. Mr. Ramsay, of Sheldford, on examination, found the os closed, and the neck of the uterus small, hard, and firm. The enlargement of the abdomen was greater on the right side than the left, and did not present the oval outline of the gravid uterus. The pains returned at intervals of a week or ten days for two months. She then became an in-patient, under Dr. Humphry's care, in Addenbrooke's Hospital, complaining at this time of constant pain in the lower part of the body, and of a blood-stained, somewhat offensive, discharge from the vagina. On examination, a swelling was found occupying the lower part of the abdomen, and extending from the symphysis pubis to about half an inch above the umbilicus, which was dull on percussion. The os and cervix uteri were as in the ordinary unimpregnated condition, and so undilatable, that it was found impossible satisfactorily to explore the interior of the uterus. During her stay in the hospital, two fetal nails were passed *per vaginam*; at the expiration of five weeks, she was discharged. Two months later, she complained of severe abdominal pain, and had

a rigor; and in the course of a few days began to pass a large number of foetal bones by the anus. From that time, the woman began to regain health and strength, and the catamenia had since been re-established. Dr. Humphry had recently examined the patient; there was still a firm swelling in the pelvis, containing probably some bones, but nothing could be discovered by the finger in the rectum or vagina.

The important practical lesson to be deduced from these two cases, and others like them, which have been recorded, was, that the result is often favourable when they are left to themselves. The chief dangers were in the earlier stages of extra-uterine foetation; but, when the later stages were reached, the prognosis was, on the whole, good.—*Brit. Med. Journ.*, July 29, 1882.

Treatment of Puerperal Convulsions by Diaphoresis.

DR. CARL BREUS, assistant in Prof. G. Braun's gynecological clinic in Vienna, contributes a paper on the above subject to the last number of the *Archiv für Gynäkologie*. The method of treatment he has adopted is that of Liebermeister, which consists in first putting the patient into a hot bath, the temperature of which is at first about 38° centigrade (100.4° Fahr.), and is gradually raised as high as the patient can bear it. After the bath, in which the patient remains about half an hour, she is wrapped, first in a sheet, and outside that several thick blankets, and left so packed for two or three hours. During the bath a profuse perspiration usually breaks out over the parts (the head and face) which are outside the water; and while in the pack, the patient sweats copiously. Diaphoretic medicines are not given, but if, while under the treatment, the patient complains of thirst, a little soda-water is allowed. After the pack the patient usually sleeps a few hours, and on awaking feels comfortable. Dr. Breus reports six cases treated in this way. In the first, eclampsia appeared in the ninth lunar month of pregnancy. After treatment in the manner just mentioned, the fits ceased ten days after their commencement, and did not recur, the patient being delivered of a living child four weeks subsequently. In the second, the convulsions attacked the patient in the sixth month of pregnancy. She was treated by diaphoresis, the fits ceased in eleven days from their commencement, and the patient was delivered of a living child six weeks afterwards, without recurrence of convulsions. The third case was one in which the convulsions appeared during labour and continued after delivery, when the packing was carried out. The patient did well. In the fourth case the first convulsion occurred at the end of the second stage of labour, and in the sixth case on the twenty-third day after delivery; each patient did well. The fifth case ended fatally on the third day, but this patient had had many seizures before admission into the hospital, and was comatose throughout the time she was under observation; besides which, she suffered from cirrhosis of the liver. Dr. Breus finds the treatment diminishes the dropsy and the amount of albumen in the urine. He does not think that it induces premature delivery; but if it did, he would not look on it as a contraindication. He does not think it should be the only treatment adopted, but that it should be combined with other measures, such as narcotics, etc. Of course, Dr. Breus's cases are too few to prove the beneficial effect of his treatment; still, a mortality of one in six is rather better than the average, which is about 30 per cent.—*Med. Times and Gazette*, July 22, 1882.

Emphysema of the Vagina.

Under this name EPPINGER describes an affection which is known under several different names. It consists in the formation in the walls of the vagina of air vesicles of various sizes, usually about as large as a cherry. They are situated in

the course of the vessels, and freely communicate with each other; they have no epithelial lining or envelope. There is much diversity of opinion as to their mode of formation. Many authors attribute them to a cystic degeneration of the vaginal follicles. Eppinger, however, thinks that the general characteristics of the affection are opposed to this mode of formation, and, without denying the presence of glands in the vaginal walls, says he has never been able to find them. According to him, it is a genuine emphysema of the vagina produced by the entrance of air into the interstitial tissue from the vagina through fissures in the epithelium.—*Rév. de Thér.*, May 1, 1882.

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The Relation of Backward Displacements of the Uterus to Painful Menstruation.

Dr. HERMAN read a paper on the above subject at the meeting of the Obstetrical Society of London, on July 5. It was admitted that there were cases of backward displacement of the uterus accompanied with dysmenorrhœa, in which the menstrual pain was relieved when the uterus was elevated and straightened. The author found, from his own experience and that of the others, that such dysmenorrhœa was slightly commoner with retroflexion than with retroversion. The object of the paper was to inquire into the explanation of these facts. Three theories had been advanced to explain them. *a.* That the dysmenorrhœa was due to narrowing of the canal at the point of flexion, and consequent obstruction to the outflow of menstrual blood. The author pointed out that there was anatomical evidence that the uterus might be bent to any extent without causing hindrance to the escape of menstrual blood; that there was no anatomical evidence that flexion ever obstructed the canal, except when the uterus was fixed by adhesions, or its wall thinned by senile atrophy; and that this theory did not explain clinical facts. *b.* That the dysmenorrhœa was due to congestion from strangulation of vessels at the point of flexion. The author found no anatomical evidence that any such strangulation ever occurred; and that the theory did not explain clinical facts. *c.* That the dysmenorrhœa was due to congestion produced by the pressure of the utero-sacral ligaments upon the veins running in the broad ligaments. The author found that the disposition of the parts concerned was such as to permit such pressure; that one case had been recorded in which there was anatomical proof that such pressure had actually occurred; that this theory was therefore supported by anatomical evidence; and that it explained clinical facts. The author's general conclusion was the following: "That while dysmenorrhœa accompanying retroflexion is often, it may be generally, dependent upon other concomitant conditions, yet that there are cases in which it is simply the result of the displacement; and that in such the dysmenorrhœa is probably entirely due, not to the flexion, but to the veins of the broad ligaments being compressed against the utero-sacral ligaments."

Dr. HEYWOOD SMITH thought that the symptoms accompanying retroflexion were generally due to other concomitant conditions, the flexion only in the minority of cases causing symptoms. The constriction at the point of flexion was apparent only, not real. In one case he had divided per rectum the utero-sacral ligaments. A low form of peritonitis followed, but the uterus had since remained in the normal position.

Dr. MATTHEWS DUNCAN said that Dr. Herman had finally disposed of two great and unduly prevalent errors. The first was that in flexion of the uterus there was a projecting spur or stricture, obstructing the passage of blood or fluid; the second was, that behind the imaginary obstruction, the uterine cavity was dilated. Much of the reasoning, both in this paper and in the one discussed at the last meeting, turned on *pain*. Pain was too ill-defined a term to be wisely

made the basis of conclusions; we had no good means of measuring its degree or kind, and nothing was more wanted. One woman would call excruciating what another would speak of as trivial. The utero-sacral ligaments could in many women be felt by the finger. Descent of the uterus so as to be grasped by the utero-sacral ligaments was a rare event. Ever since the paper of Dr. John Williams, which had pointed out their action, he had attended to this matter clinically; but his observations had yielded him nothing of sufficient importance to lay before the Society.

Dr. HERMAN said it was impossible to avoid reasoning from pain; and he thought that errors due to the incorrect statements of a few individual patients became neutralized by taking a large number of cases. He did not think that the cases in which the utero-sacral ligaments caused congestion of the uterus were more than a small minority.—*Med. Times and Gazette*, July 22, 1882.

Displacement of the Uterus.

In the last number of the *Archiv für Gynäkologie* (Bd. xix. Hf. 2), is a contribution by Dr. VEDELER, of Christiana, on Displacements of the Uterus, in which the author brings forth evidence on a large scale, which must contribute materially to the formation of an accurate estimate of the part taken by such conditions in the production of symptoms. Dr. Vedeler has examined not only women who complained of pelvic troubles, but women who appeared, and stated themselves to be, perfectly healthy, and in whom no disease could be found. All women who complained of pelvic trouble, or in whom erosion, perimetritis, or tenderness around the uterus was discovered, were classed among the sick. The total number examined was 3012; of these 18 suffered from prolapsus, and will not be further referred to. Of the remainder, in 15 per cent. the uterus was in the so-called normal position, in 12 per cent. it was anteverted, in 10 per cent. retroverted, in 54 per cent. anteflexed, and in 8 per cent. retroflexed. So that of 3012 women of the menstrual age, and of all conditions, single, married, etc., anteflexion was present in more than half the whole number. Again, 466 of the number were virgins, 749 nulliparous, 322 were from two to three months pregnant, and 1465 mothers.

Of the 466 virgins, 52 were suffering, and 414 enjoyed good health. The percentage of those in whom the uterus was found in the various positions which it may assume was much the same in the healthy as in the suffering; but it is curious and important to note that the so-called normal position was met with in only 7 per cent. of the healthy, while it was found in 6 per cent. of the complaining; anteflexion, however, was found in 71 per cent. of the healthy, and in 70 per cent. of the ailing.

In healthy nulliparous women, the normal position was found in 9 per cent. only, and anteflexion in 71 per cent.; in nulliparous women who complained of pelvic symptoms, the normal position was found in 15 per cent. and anteflexion in 56 per cent. only. Here the normal position obtained considerably more frequently, and anteflexion considerably less frequently, in the diseased than in the healthy state. Anteflexion of the uterus was found in 68 per cent. of all single and nulliparous women—the total number examined being 1215. This is a higher estimate than that of some other authors; the mean estimate of seven observers (431 cases observed) being 43, while Herman's estimate is 48 per cent. (111 cases examined). The number examined by Vedeler, however, is so large that his results are probably less liable to accidental error.

In those who were mothers the percentages of the various positions were somewhat altered, the normal position being met with in 22 per cent., and anteflexion in 37 per cent. of the healthy, while in the ailing the normal position was found

n 23 per cent. and antelexion in 38 per cent. In early pregnancy antelexion was met with in 80 per cent. of the cases.

The data supplied by Dr. Vedeler are the largest hitherto collected, and they embrace all conditions of adult women. They have a most important bearing upon a question which has for a long time excited the attention of general physicians as well as gynæcologists, and cannot fail of having considerable weight in future discussions of flexions of the uterus and their place in uterine pathology. Besides the magnitude of the figures there are other features appertaining to these data which should be kept in view.

The women examined were not all subject to uterine troubles, but a very large number of virgin and nulliparous subjects examined were in the enjoyment of good health, and made no complaint of symptoms attributable to the pelvic organs. The total number of single and nulliparous women was 1215, and 920 of them had no uterine suffering. This fact gives the work of Dr. Vedeler the highest value; it helps us to discover the most usual position assumed by the uterus in a healthy state of the pelvis, and, together with the other data contained in the paper, it places the subject upon a firm and scientific basis. In about 75 per cent. of healthy women who have not had children, the uterus is in a state of anteversion or antelexion, while a similar position of the organ is found in 70 per cent. of such women who complain of uterine suffering; and the so-called normal position is found in 8 per cent. only of such women in health, but is found in 13 per cent. when they suffer from uterine disease. Again, the highest proportion of cases of the so-called normal position is found in those who have had children, as well as the lowest proportion of antelexion. Both conditions are, however, met with almost exactly the same frequency in disease as in health. It is further found in virgins, nulliparæ, and mothers, that although child-bearing has an influence on the position of the uterus, yet the frequency with which any given position of the uterus occurs in health is so nearly the same as the frequency with which it is met with in disease, that it is not possible to charge so-called displacements with being the cause of any symptoms.—*Lancet*, June 24, 1882.

Primary Cancer of the Body of the Uterus.

Primary cancer of the body of the uterus is one of those forms of disease which occur so rarely in the practice of any individual, that their clinical history can only be traced by putting together cases recorded in literature. This has been done, as to the affection named, with more or less fulness and accuracy, by several writers. The latest, and, as it seems to us, the most critical, and therefore probably the most correct, has been published by Drs. C. RUGE and J. VEIT, in a recent number of the *Zeitschrift für Geburtshülfe und Gynäkologie*, and it seems to us that their conclusions are worth notice.

Secondary cancer of the body of the uterus, either by direct extension of new growth from the cervix, or by isolated nodules of secondary growth, is much commoner than such disease as a primary occurrence. Thus Blau, out of 87 autopsies on patients dying with cancer of the neck of the womb made at the Berlin Charité, found that in 29 cases the growth had directly extended to the body of the organ, and that in 9 there were secondary growths in that part. All cases of this kind must of course be excluded before the history of *primary* cancer can be correctly written. The earlier writings on the subject fail to command the confidence of Drs. Ruge and Veit, partly because they are not careful enough to separate primary from secondary disease.

The estimates which have been formed of the frequency of cancer of the body as compared with that of the cervix vary from 1 in 16 to 1 in 420—a divergence the extent of which shows how untrustworthy some of the accounts must be.

Ruge and Veit base their conclusions on forty-three critically examined indubitable cases, of which twenty-one have come under their own observation, and twenty-two have been collected from literature.

Cancer of the body of the uterus they regard as essentially a disease of the mucous membrane; it originates in the endometrium. Macroscopically they find that two forms exist—the diffuse, and the circumscribed or polypoid. The former appears to be the more frequent. But whether the two forms are radically different from the beginning, or whether they are in early stages alike, but differ in their mode of growth, is very difficult to ascertain. The growth may extend over the whole inner surface of the uterus, the cervix only being unaffected. In other cases the greater part of the uterine wall may remain free, and the neoplasm form an isolated tumour at one spot, which may hollow out the opposite wall of the cavity where the growth comes in contact with it.

With the advance of the disease the uterus enlarges—an enlargement not altogether due to the bulk of the diseased tissue, but rather analogous to the enlargement due to pregnancy. Just as the uterine enlargement in the early months of pregnancy is out of proportion to the size of the contained ovum, so the enlargement of the uterus which accompanies cancer of its body is greater than the growth itself could cause. As the growth enlarges, and invades the uterine wall, its older parts degenerate and break down, and thus the uterine cavity may either become enlarged (the external dimensions of the uterus remaining the same), or the uterus may contract and the cavity remain small, and thus an apparent diminution in size may follow the enlargement of the uterus present at the beginning.

In the circumscribed or polypoid form, the growth projects into the uterine cavity, growing from a more or less broad base in the middle of healthy mucous membrane. In its growth it does not creep along the surface, but spreads centrifugally, radiating through the muscular tissue and towards the peritoneum. The polypoid growth may break down or slough off, and then the knots of growth in the muscular wall of the uterus be the only visible disease. In this variety the growth projecting into the cavity is smooth on the surface, while in the diffuse form it is villous or warty. The authors have never seen nodules in the muscular tissue of the uterus without finding reason to think that the disease had begun in the mucous membrane and progressed in the manner above described. They do not deny the existence of metastatic nodules, but they have never seen them. To put the same thing in other words, they have never seen a case of primary cancer of the body of the uterus in which the mucous membrane was not affected. They do not find any satisfactory evidence of myomatous growths undergoing cancerous transformation, although such tumours may lead to overgrowth of mucous membrane and gland tissue, and this hypertrophied mucous membrane may become the seat of malignant change, and from the mucous membrane the disease may spread into the tumour.

One important practical question is, whether chronic endometritis in any of its forms tends to lead to cancer. Drs. Ruge and Veit regard intractable or recurring endometritis as a process so much resembling malignant disease that there is good ground for suspecting that it may become genuine cancer; but they have never seen the transformation occur. The two diseases, although somewhat alike, are yet essentially different: the one is a hyperplasia; the other a heteroplasia, leading to destruction of the part affected, and infective lesions of other parts.

Cancer of the body of the uterus shows some differences from cancer of the cervix in its mode of progress. The lumbar glands become affected earlier; but the disease does not extend so soon into the parametric tissues. Death from uræmia is not so common as in cancer of the cervix.

With regard to its etiology, the figures of Ruge and Veit show, as have done

those of former investigators, that cancer of the body of the uterus is apt to occur at a somewhat later period of life than cancer of the cervix; and that a larger proportion of the patients affected by the former kind of disease are virgins or nulliparæ, than is the case with the latter, the liability to which, as is known, increases in proportion to the number of children a woman has borne. Another etiological point which our authors bring out is, that in cases of cancer of the body of the uterus, menstruation often seems to have persisted to a later age than usual. This may, of course, have been due to the unsuspected commencement of the disease, or to some morbid change, such as endometritis, which laid the foundation for it. Their inductions upon each of these points are, however, based on but a small number of cases.

With regard to symptoms they have little new to say. Pain, hemorrhage, watery and sometimes fetid discharge, belong, as every one knows, to cancer of the womb, whether cervix or body be affected. Sir James Simpson described a pain, often so severe as to make the patient cry out, recurring at a definite hour of the day, lasting a longer or shorter time, and then ceasing altogether until its next recurrence; and he believed that such pain indicated with some certainty the presence of cancer of the uterine body. Our authors have observed such pain in thirteen of their cases, but they did not find it recur quite as regularly and exactly as Simpson stated. They have noticed, moreover, that it occurs in cases in which, with extensive disease of the body of the uterus, the cervical canal is narrow; and they have found it relieved by thoroughly scraping out the uterine cavity. They believe it is due to uterine contraction, excited by the presence of bits of necrosed tissue unable to escape through the narrow cervical canal. They, therefore, do not attach to this symptom as much diagnostic importance as did Sir James Simpson. The other symptoms which arise as the disease extends—cachexia, bladder and bowel troubles, etc.—present nothing peculiar.

The diagnosis is to be made by bimanual examination and the microscope. By the former we find what feels like a tensely distended uterus, either smooth on the surface or presenting small nodules, and this, with hemorrhage and a high degree of cachexia, should arouse a suspicion of cancerous disease. The diagnosis is made certain in the authors' opinion, by scraping a bit of tissue from the interior of the womb, and examining it with the microscope. They admit, however, that considerable practice is necessary to distinguish with certainty cancerous tissue from that of mucous membrane altered by inflammatory changes, or from sarcoma. It appears to us that the amount of histological experience required to warrant a confident opinion is so great that it is likely to be long before this method of diagnosis can take its place among the ordinary resources of the practitioner.

The treatment is of two kinds: radical and palliative. The radical treatment is, of course, removal of the uterus; and as we have frequently put before our readers accounts of what has been done in this direction, we shall not further refer to it here. As a palliative measure the authors speak very strongly of the advantage of vigorously scraping out the uterus. They find improvement in all symptoms, especially in bleeding and pain, follow its practice; and they think that the only risk attending it is that of perforation of the uterus. The benefit is sometimes so striking, that it has been taken for cure. In one case the authors state that the patient remained free from every symptom for a year and a half. After scraping out the uterus, caustic may be applied, but they do not think that the relief is rendered more lasting by this means. From all other palliatives they find that little benefit is to be expected. Highly as they think of the effect of scraping out the uterus, yet they only recommend it when radical treatment is impossible, and bleeding and pain are severe.—*Med. Times and Gaz.*, July 29, 1882.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Iodoform Poisoning following its Use as a Surgical Dressing.

The various writers on iodoform intoxication agree very closely in their description of the symptoms. SCHEDE describes them in considerable detail, and so does KÖNIG, who gives clinical details of 48 cases collected from various quarters.

SCHEDE classifies the milder cases as follows:—

1. The commonest form is elevation of temperature (aseptic fever) immediately following the application of iodoform and lasting several days. It may occur only after the first application, or with each renewal, and though it may be considerable, is not dangerous. König states that it is not more liable to occur from the use of iodoform than from carbolic acid.

2. With or without fever, the patient is uneasy, irritable, dazed, laconic, suffers from headache and anorexia, and complains of the taste of iodoform in the mouth. The pulse is rapid, small, weak, and compressible. These cases recover rapidly when the drug is removed.

3. Either without fever, or with a very considerable degree of it, the pulse is extremely rapid, it may be 150, 180, or more, even in adults. In spite of this the patient may feel well, or only suffer slightly from the symptom last described, but great danger is imminent if the use of iodoform is continued.

Other symptoms recorded are spasmodic dyspnoea, aphasia, albuminuria, with scanty urine containing a large proportion of salts of iodine. Sudden collapse after an operation has been ascribed by Schede and others to iodoform dressings. Most deny the connection, however, and König puts these deaths into an unexplained list, which he says were in former times ascribed to shock, later to chloroform, more recently to "Listerism," and now must need be set down to iodoform.

ASCHENBRANDT and HENRY, experimenting on animals, have found the application of iodoform to wounds of the respiratory passages cause pneumonia or œdema of the lungs from inhalation of the vapour of the drug.

The time when symptoms are apt to arise varies from immediately after to six days after the application of the drug. This delay in their appearance suggests to Schede a cumulative action, and he thinks danger is increased in some persons by the presence of an idiosyncrasy. He says: "There is an idiosyncrasy against iodoform, which makes it for the persons concerned a dangerous poison, the more so that there is no symptoms to suggest special care, and that in many cases the poisonous action seems to be cumulative, so that the symptoms of poisoning make their appearance suddenly and with great severity, and then even instant withdrawal of the drug does not avert the fatal issue." The existence of this idiosyncrasy is denied by others, but the theory of the cumulative action meets more general acceptance. (Kocher, Bum, etc.).

The symptoms are by BUM, MOSETIG-MOORHOF, and others, attributed to the presence of considerable quantities of free iodine in the blood, and are held by them to be the same as those of poisoning by iodine. KOCHER, again, holds that its action does not resemble that of iodine, but that of chloroform, causing anæmia of the brain.

The various writers are not by any means agreed as to the amount of danger incurred by the use of iodoform. HÆFTMANN states that out of a thousand cases where it was employed, there were only two in which any general symptoms were produced, and that "Schede's symptoms" were not once seen. Mosetig-Moorhof denies altogether that iodoform itself, *properly used*, will cause constitutional disturbance. He has treated cases for four years with it, having treated in that time seven thousand hospital patients, how many of them with iodoform he does not

state. He has used it freely, however, under hygienic and other circumstances, in no way differently from other surgeons, and has not once observed such symptoms as Schede, König, and others have described. With König, he would ascribe many of these symptoms to shock, or chloroform, to the mental or "psychic" disturbance which may follow any operation (traumatic delirium?), or even to the absorption of carbolic acid used during the operation by many surgeons for washing the wound or purifying the instruments, sponges, assistants' hands, etc. Bum, his assistant, admits that the iodoform may be the proximate cause, but also blames the carbolic acid for their occurrence. He holds that the iodine set free in the blood by the absorbed iodoform is not hurtful if it can at once combine with alkalies in the blood, and be rapidly excreted by the kidneys; but evil will result if the iodine is set free in too great quantity to be at once taken into combination, or if its excretion in combination is hindered. The use of carbolic acid along with iodoform is therefore dangerous, owing to the acid causing, as it so often does, a certain degree of nephritis, and so hindering excretion.

Treatment.—Concerning curative treatment of iodoform poisoning, very little can be said. When symptoms arise, the use of iodoform must at once be discontinued (König), though that does not always avail (Schede). No antidote to the drug has yet been discovered. In one severe case Kocher tried transfusion of blood in vain; in another, the intra-venous injection of a saline solution was found beneficial, he supposes by averting the tendency to death by cerebral anæmia.

With regard to preventive treatment, more can be said. Mosetig-Moorhof attributes the immunity from symptoms in his cases to the following reasons:—

- "1. Iodoform was not used in excessive quantity.
- "2. Iodoform was never compressed within a wound" (he believes that any firm compression by bandages forces the iodoform with secretions into the cellular tissue, and so causes it to be rapidly absorbed, and in considerable quantity).
- "3. Dressings were seldom changed.
- "4. When dressings were changed the wound was never washed, nor was fresh iodoform applied, because it was borne in mind that absorption is more rapid in granulating than in fresh wounds.
- "5. Whenever iodoform was originally applied, *it only* was used, any other antiseptic being unnecessary, superfluous, or even hurtful. The simultaneous action of carbolic acid, especially, and iodoform is directly hurtful, or even dangerous, not only to the wound, but to the organism."

Bum concludes his article with the following summary:—

"1. Iodoform is poisonous when iodine set free by it in the system does not immediately become combined.

"2. This will happen when—

(a) The proportion of iodoform absorbed is too great.

(b) There is quantitative or qualitative alteration in the blood, or more certainly when both are present.

"3. The application of large quantities of iodoform, either at once or by quickly renewed dressings, is to be avoided in anæmic, in very youthful, or in very aged persons.

"4. Iodoform dressings, in order to avoid any cumulative action, should be renewed as seldom as possible.

"5. Absorption being promoted by pressure, dressings should not be tightly bandaged when iodoform is applied to a wound."—*Glasgow Medical Journal*, September, 1882.

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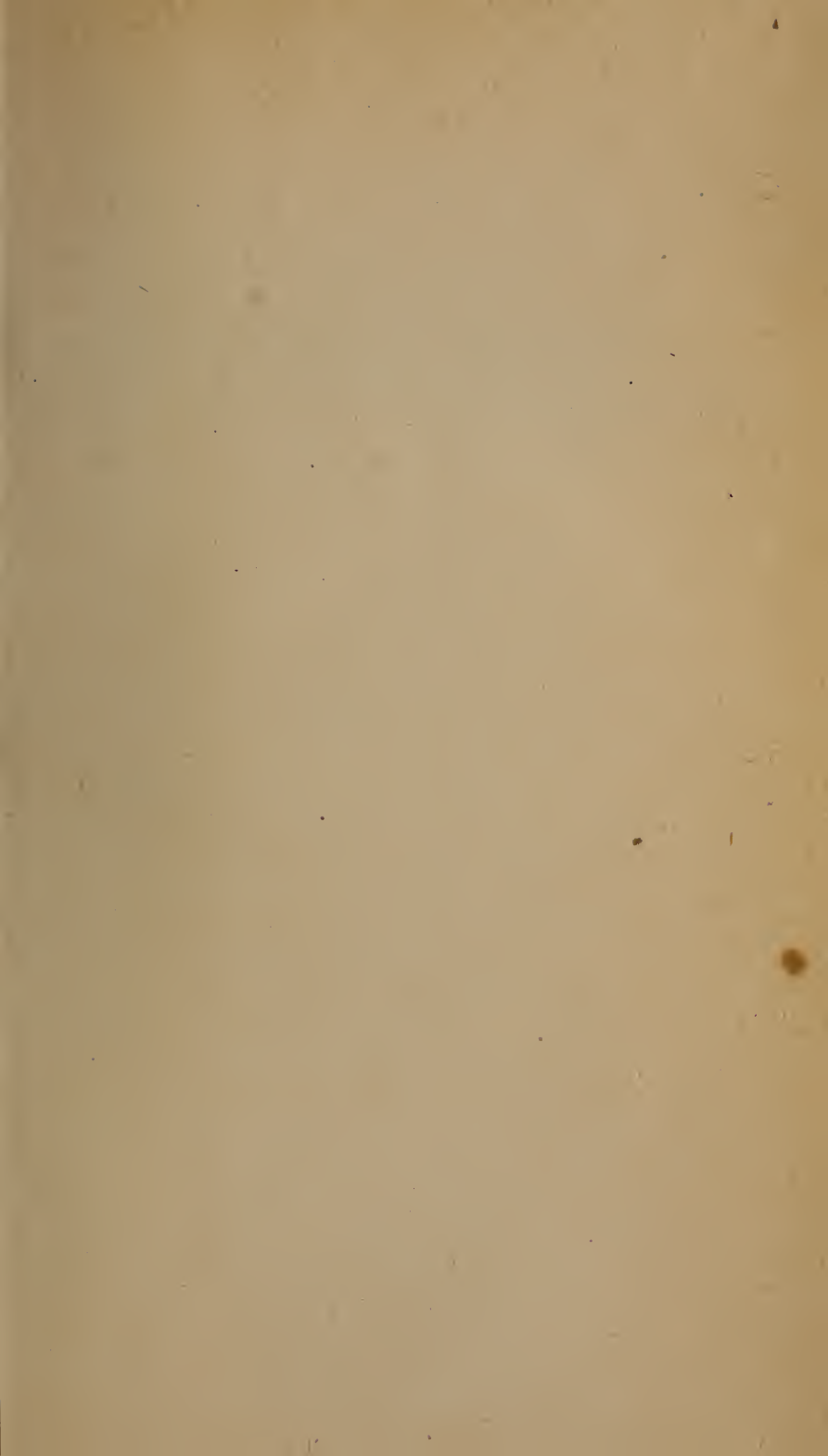
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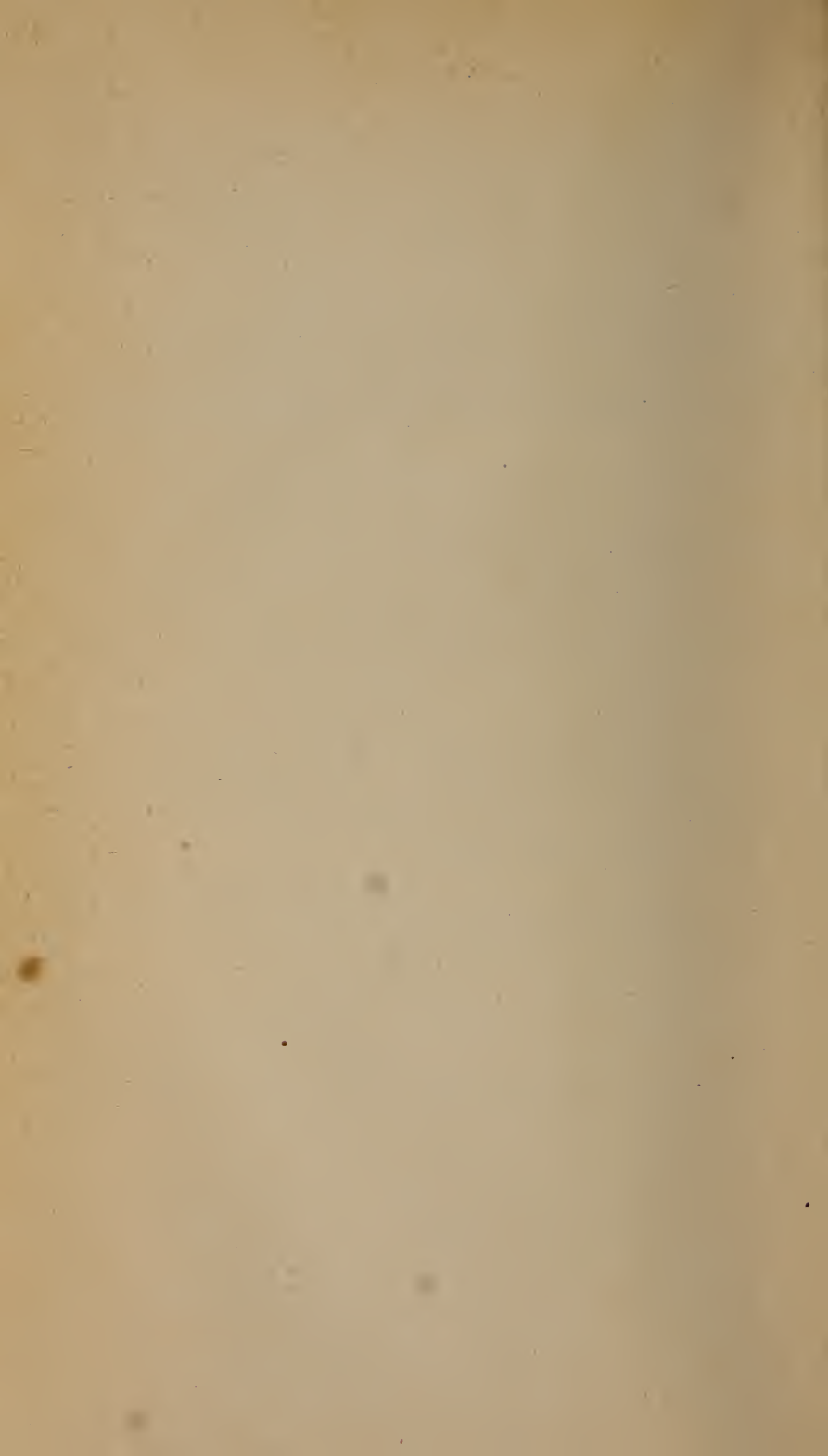
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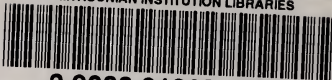
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